

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

APPLE INC.,
Petitioner/Appellant

Appeal No. 2022-2288

v.

COREPHOTONICS, LTD.,
Patent Owner/Appellee

Proceeding No.: IPR2020-00489

NOTICE FORWARDING CERTIFIED LIST

A Notice of Appeal to the United States Court of Appeals for the Federal Circuit was timely filed September 26, 2022, in the United States Patent and Trademark Office in connection with the above identified *Inter Partes Review* proceeding. Pursuant to 35 U.S.C. § 143, a Certified List is this day being forwarded to the Federal Circuit.

Respectfully submitted,

Date: November 8, 2022

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Under Secretary of Commerce for Intellectual Property and
Director of the United States Patent and Trademark Office

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing NOTICE FORWARDING CERTIFIED LIST has been served, via electronic mail, on counsel for Appellant and Appellee this 8th day of November, 2022, as follows:

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**U.S. DEPARTMENT OF COMMERCE
United States Patent and Trademark Office**

November 8, 2022

(Date)

THIS IS TO CERTIFY that the attached document is a list of the papers that comprise the record before the Patent Trial and Appeal Board (PTAB) for the *Inter Partes Review* proceeding identified below.

**APPLE INC.,
Petitioner,**

v.

**COREPHOTONICS, LTD.,
Patent Owner.**

**Case: IPR2020-00489
Patent No. 10,015,408 B2**
By authority of the

**DIRECTOR OF THE UNITED STATES
PATENT AND TRADEMARK OFFICE**

Macia L. Fletcher

Certifying Officer



Prosecution History ~ IPR2020-00489

Date	Document
2/5/2020	Petition for Inter Partes Review
2/5/2020	Petitioner's Power of Attorney
2/5/2020	Petitioner's Notice for Filing Two Petitions
2/12/2020	Notice of Filing Date Accorded to Petition
5/8/2020	Patent Owner's Mandatory Notices
5/8/2020	Patent Owner's Power of Attorney
5/12/2020	Patent Owner's Preliminary Response
7/31/2020	Decision - Institution of Inter Partes Review
9/21/2020	Scheduling Order
10/26/2020	Notice of Deposition - Sasian, Ph.D.
10/28/2020	Amended Notice of Deposition - Sasian, Ph.D.
11/16/2020	Joint Stipulation to Modify Due Date 1 and Due Date 2
11/25/2020	Patent Owner's Response
11/26/2020	Patent Owner's Certification of Word Count for Patent Owner's Response to Petition for Inter Partes Review
3/2/2021	Petitioner's Updated Mandatory Notices
3/2/2021	Notice of Deposition - Moore, Ph.D.
3/4/2021	Joint Stipulation to Modify Due Dates 2 and 3
3/25/2021	Petitioner's Reply
4/6/2021	Notice of Deposition - Sasian, Ph.D.
4/23/2021	Patent Owner's Sur-Reply
4/30/2021	Patent Owner's Request for Oral Argument
4/30/2021	Petitioner's Request for Oral Argument
5/6/2021	Motion for Pro Hac Vice Admission - Fenster and Tsuei
5/10/2021	Order - Setting Oral Argument
5/11/2021	Order - Pro Hac Vice Admission - Fenster and Tsuei
5/17/2021	Joint Stipulation to Alternative Schedule for Serving Demonstratives and Request to Modify Schedule from that Set in Hearing Order
5/24/2021	Petitioner's Demonstratives for Oral Hearing
5/25/2021	Patent Owner's Oral Hearing Demonstratives
5/26/2021	Patent Owner's Objections to Petitioner's Oral Hearing Demonstratives
5/26/2021	Petitioner's Objections to Patent Owner's Demonstratives for Oral Hearing
7/12/2021	Oral Hearing Transcript
7/26/2021	Final Written Decision
8/25/2021	Patent Owner's Brief Regarding Admission of LG Innotek Brief into the Record
8/25/2021	Petitioner's Request For Rehearing
9/1/2021	Petitioner's Opposition to Patent Owner's Brief Regarding Good Cause for Admission of LG Innotek Brief Into Evidence
9/1/2021	Patent Owner's Brief Regarding Admission of Corephotonics Korean Brief into the Record
9/7/2021	Notification of Receipt of Precedential Opinion Panel (POP) Request
9/14/2021	Notification of Receipt of POP Request: Amicus Form
2/4/2022	Order - POP Request

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Date	Document
5/12/2022	Panel Change Order - Conduct of the Proceeding
7/27/2022	Decision - Request for Rehearing

Trials@uspto.gov
571-272-7822

Paper 32
Entered: July 26, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

COREPHOTONICS, LTD.,
Patent Owner.

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Patent 10,015,408 B2

Before BRYAN F. MOORE, GREGG I. ANDERSON, and
MONICA S. ULLAGADDI, *Administrative Patent Judges*.

ULLAGADDI, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

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I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition to institute an *inter partes* review of claims 5 and 6 (“the challenged claims”) of U.S. Patent No. 10,015,408 B2 (Ex. 1001, “the ’408 patent”). Paper 2 (“Pet.”). Corephotonics, Ltd. (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”).

We instituted an *inter partes* review of each of the challenged claims on the ground set forth in the Petition. Paper 8 (“Institution Decision” or “Inst. Dec.”). Patent Owner filed a Patent Owner Response (Paper 13, “PO Resp.”), and Petitioner filed a Petitioner Reply (Paper 18, “Pet. Reply”). Patent Owner thereafter filed a Sur-reply (Paper 20).

Oral arguments were heard on May 26, 2021, and a transcript has been entered into the record. Paper 31 (“Tr.”). Petitioner objected to various slides in Patent Owner’s demonstratives for the oral hearing (Paper 29) and Patent Owner similarly objected to various slides in Petitioner’s demonstratives (Paper 30).

Petitioner has the burden of proving unpatentability of the challenged claims by a preponderance of the evidence. 35 U.S.C. § 316(e) (2018). Having reviewed the parties’ arguments and supporting evidence, for the reasons discussed below, we determine that Petitioner has not demonstrated by a preponderance of the evidence that any of the challenged claims are unpatentable.

II. BACKGROUND

A. *Related Proceedings*

Petitioner and Patent Owner identify the following corresponding district court proceeding: *Corephotonics, Ltd. v. Apple Inc.*, Case No. 5:19-

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cv-04809-LHK (N.D. Cal.). Pet. 1–2; Paper 6, 1.¹ Petitioner also notes the filing of a related *inter partes* review (IPR2020-00488) challenging claims 1–4 and 7 of the ’408 patent. Pet. 2. We did not institute trial in that proceeding. IPR2020-00488, Paper 9 (decision denying *inter partes* review).

B. The ’408 Patent

The ’408 patent issued from an application that is a continuation of U.S. Application No. 14/880,251, filed on October 11, 2015, which is a continuation of U.S. Application No. 14/365,711, which was filed on June 16, 2014, and matured into U.S. Patent No. 9,185,291. Ex. 1001, code (63). U.S. Application No. 14/365,711 is an application under 35 U.S.C. § 371 of international patent application PCT/IB2014/062180, filed on June 12, 2014, and claims priority to U.S. Provisional Application No. 61/834,486, filed on June 13, 2013. *Id.* at code (60), 1:7–16.

The ’408 patent concerns a dual-aperture zoom digital camera that operates in both still and video modes. *Id.* at code (57). The camera includes a Wide sub-camera and a Tele sub-camera, each of which includes a fixed focal length lens, an image sensor, and an image signal processor. *Id.* at 3:32–35. Figure 1A, reproduced below, illustrates a dual-aperture zoom imaging system, which is also referred to as a digital camera. *Id.* at 5:60–61, 6:18–20.

¹ Patent Owner cites *Corephotonics, Ltd. v. Apple Inc.*, Case No. 3:19-cv-04809-LHK (N.D. Cal.) (Paper 6, 1), but this case number appears to reflect a typographical error. A PACER search of Case No. 5:19-cv-04809 reveals that Patent Owner’s complaint in that case was likewise erroneously identified as “Civil Action No. 3:19-cv-4809” on its cover page.

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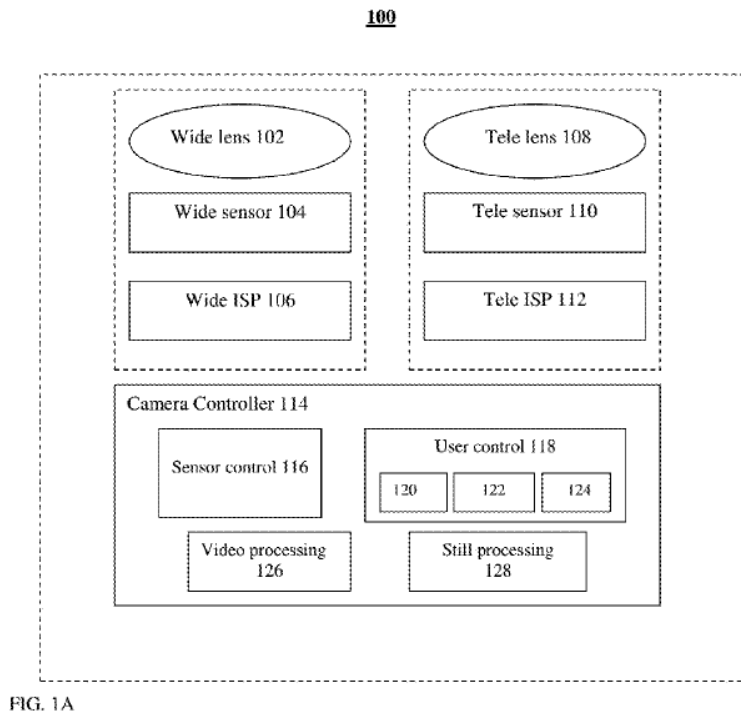


Figure 1A shows a dual-aperture zoom imaging system. *Id.*

In some embodiments, “the lenses are thin lenses with short optical paths of less than about 9mm” and “the thickness/effective focal length (EFL) ratio of the Tele lens is smaller than about 1.” *Id.* at 3:39–41. These size specifications reflect the fact that “[h]ost device manufacturers prefer digital camera modules to be small, so that they can be incorporated into the host device without increasing its overall size.” *Id.* at 1:31–33. An exemplary thin camera may use a lens block for the Tele lens, where the lens block may include five lens elements. *See id.* at 12:44–61. Figure 9, reproduced below, illustrates a lens block with first lens element 902 having positive power, second lens element 904 having negative power, third lens element 906 having positive power, fourth lens element 908 having negative power, and fifth lens element 910 having positive or negative power. *Id.* at 12:54–61.

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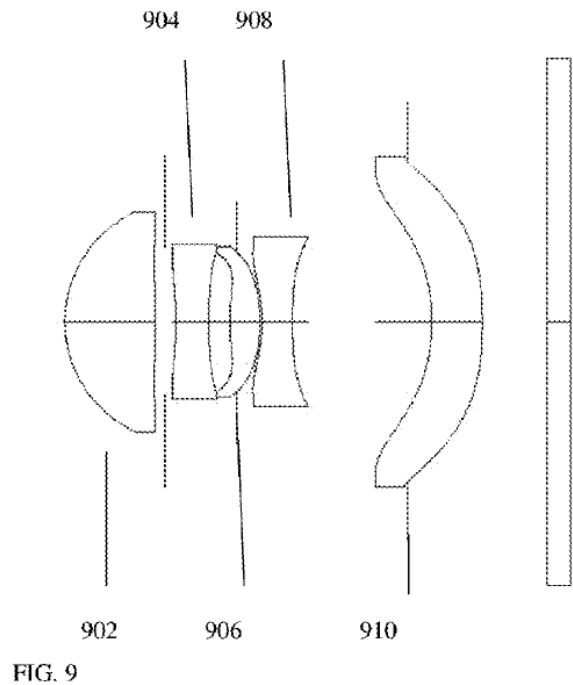


Figure 9 shows a lens block in a thin camera. *Id.* at 6:12–13.

The '408 patent discloses that in still mode, the camera performs zoom by either fully or partially fusing Wide and Tele images, where a fused image includes information from both Wide and Tele images. *Id.* at 3:44–49. In video mode, however, the camera performs optical zoom by switching between Wide and Tele images—i.e., without fusion—in order “to shorten computation time requirements, thus enabling high video rates.” *Id.* at 3:51–54. The invention uses the Wide sub-camera output for a low zoom factor (ZF) and the Tele sub-camera output for a high ZF. *Id.* at 11:13–29.

Normally, a user sees a jump, or discontinuous image change, when the camera switches between sub-camera output images. *Id.* at 10:37–39. The '408 patent addresses this issue by employing a “smooth transition,” which “is a transition between cameras or [points of view] that minimizes the jump effect,” and which “may include matching the position, scale,

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brightness and color of the output image before and after the transition.” *Id.* at 10:39–45. Because “an entire image position matching between the sub-camera outputs is in many cases impossible,” a smooth transition may achieve position matching “only in the [region of interest] while scale brightness and color are matched for the entire output image area.” *Id.* at 10:45–52.

C. Challenged Claims

Petitioner challenges claims 5 and 6 of the ’408 patent. Claim 5 is independent, and claim 6 depends from claim 5. Independent claim 5 is reproduced below.

5. A zoom digital camera comprising:

a) a first imaging section that includes a fixed focal length first lens with a first field of view (FOV₁) and a first image sensor; and

b) a second imaging section that includes a fixed focal length second lens with a second FOV (FOV₂) that is narrower than FOV₁, and a second image sensor, wherein the second lens includes five lens elements along an optical axis starting from an object starting with a first lens element with positive power, wherein the five lens elements further include a second lens element with negative power, a fourth lens element with negative power and a fifth lens element, wherein a largest distance between consecutive lens elements along the optical axis is a distance between the fourth lens element and the fifth lens element, and wherein a ratio of a total track length (TTL) to effective focal length (EFL) of the second lens is smaller than 1.

Ex. 1001, 14:1–18.

D. Asserted Ground of Unpatentability

Petitioner challenges claims 5 and 6 as follows. *See* Pet. 11.

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Claims Challenged	35 U.S.C. §	Reference(s)/Basis
5, 6	103	Golan ² , Kawamura ^{3, 4}

In support, Petitioner relies on the declaration of Dr. José Sasián (Ex. 1003).

III. ANALYSIS

A. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is

² U.S. Patent Application Publication No. 2012/0026366 A1, published Feb. 2, 2012 (Ex. 1005, “Golan”).

³ Japanese Patent Application Publication No. S58-62609, published Apr. 14, 1983 (Ex. 1007, “Kawamura”).

⁴ Petitioner asserts “Kawamura was published September 14, 2006, and issued December 20, 2011.” Pet. 12. This appears to be a mistake because Kawamura is a published application—not an issued patent—with a publication date of April 14, 1983. Ex. 1007, codes (11), (12), (43).

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unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). The burden of persuasion never shifts to Patent Owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in an *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

B. Level of Ordinary Skill in the Art

Petitioner contends,

a Person of Ordinary Skill in the Art (“POSITA”) at the time of the claimed invention would have a bachelor’s degree or the equivalent degree in electrical and/or computer engineering, physics, optical sciences or a related field and 2–3 years of experience in imaging systems including optics and image processing.

Pet. 8–9. Petitioner supports its contention with the testimony of Dr. Sasián. Ex. 1003 ¶ 20.

Patent Owner argues that “[a] person of ordinary skill in the art (POSITA) of the ’408 patent, at the time of the effective filing date, would have possessed an undergraduate degree in optical engineering, electrical engineering, or physics, with the equivalent of three years of experience in optical design.” PO Resp. 12–13. Patent Owner supports its contention with the testimony of Dr. Duncan Moore. Ex. 2003 ¶ 14. Patent Owner

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further contends that “the effective filing date of the ’408 patent is June 13, 2013,” and that “Apple’s expert Dr. Sasián appears to have applied the date of June 13, 2013 in his analysis of the level of ordinary skill as well.” PO Resp. 13 (citing Ex. 1003 ¶ 19).

The parties do not appear to dispute the effective filing date of the challenged claims and each rely on June 13, 2013, the earliest claimed priority date of the ’408 patent, as the effective filing date in making their respective arguments. Accordingly, we determine the level of ordinary skill in the art as of this date. However, if the ’408 patent is not entitled to the filing date of the provisional application from which it claims priority and is, instead, entitled to a *later* date, this would not alter the conclusions rendered in this Decision.

Neither party argues that the level of ordinary skill is dispositive of any issue. Further, we do not discern significant differences between the parties’ definitions. The conclusions rendered in this Decision do not turn on selecting a particular definition for the level of ordinary skill. We determine that the level of ordinary skill in the art proposed by Petitioner is consistent with the ’408 patent and the asserted prior art and as such, we adopt and apply Petitioner’s proposal.

C. *Claim Construction*

For *inter partes* reviews filed on or after November 13, 2018, we apply the same claim construction standard used by Article III federal courts and the International Trade Commission, both of which follow *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), and its progeny. See 37 C.F.R. § 42.100(b); Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal

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Board, 83 Fed. Reg. 51,340, 51,341 (Oct. 11, 2018). Accordingly, we construe each challenged claim of the '408 patent to generally have “the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b).

Petitioner proposes a construction for one limitation, as discussed in detail below. Pet. 9–11. Patent Owner disagrees with Petitioner’s proposed construction, as further detailed below. *See* Prelim. Resp. 15–17; PO Resp. 13–16.

“smooth transition”

Dependent claim 6 recites “the camera controller configured to provide video output images with a smooth transition when switching between a lower zoom factor (ZF) value and a higher ZF value or vice versa.” Ex. 1001, 14:21–24.

Petitioner contends “a POSITA would have understood . . . ‘*smooth transition*’ to mean ‘transition with a reduced discontinuous image change,’ for example, a transition with a continuous image change.” Pet. 10 (citing Ex. 1003 ¶¶ 44–47). Petitioner asserts the Specification supports this proposed construction. *Id.* at 10–11. In our Institution Decision, we rejected Petitioner’s proposed construction and preliminarily concluded that “smooth transition” means “a transition between cameras or points of view that minimizes the jump effect.” Inst. Dec. 11. In its Petitioner Reply, Petitioner asserts that

[i]n the context of claim 6 of the subject '408 Patent, the language of “a transition between cameras or points of view” in the construction for “smooth transition” is redundant and unnecessary, because claim 6 itself provides “*a smooth transition when switching between a low zoom factor (ZF) value and a*

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higher ZF value or vice versa.” Given the language of the claim, Petitioner’s proposed construction is entirely consistent with that adopted in the Institution Decision, and Petitioner’s analysis applies to either construction.

Pet. Reply 2 (citing Ex. 1001, 14:22–24; Ex. 1013 ¶¶ 4–5).

Patent Owner disputes Petitioner’s proposed construction for “smooth transition.” PO Resp. 13–16. Patent Owner contends that “the term ‘smooth transition’ should be construed as ‘a transition that minimizes the jump effect such that there is no jump in the ROI region.’” *Id.* at 16 (citing Ex. 2003 ¶ 44). This is a shift from its position in its Preliminary Response in which Patent Owner contends that “‘smooth transition’ should be construed as it was for the ’291 patent: ‘a transition between cameras or POVs that minimizes the jump effect.’” Prelim. Resp. 17. We point out this contention from the Preliminary Response to highlight the fact that Patent Owner’s earlier proposed construction was an agreed-to construction from a district court litigation for related U.S. Patent No. 9,185,291.⁵ *See* Prelim. Resp. 15–17; Ex. 2001, 2 (Joint Claim Construction and Prehearing Statement).

Based on our review of the complete record developed at trial, we conclude that our resolution of Petitioner’s asserted ground of unpatentability does not turn on the construction of “smooth transition” or any other claim term. *Infra* §§ III.D.3–III.D.4. As such, we need not expressly construe “smooth transition” or any other claim term to resolve the dispute between the parties, and therefore, we do not expressly define any claim term. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (explaining that construction is needed

⁵ The ’408 patent claims priority to the ’291 patent. *See* Ex. 1001, code (63).

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only for terms that are in dispute, and only as necessary to resolve the controversy).

D. Obviousness over Golan and Kawamura

Petitioner contends that claims 5 and 6 are unpatentable as obvious under 35 U.S.C. § 103 over Golan and Kawamura. Pet. 13–56. For the reasons that follow, we determine that the evidence does not sufficiently support Petitioner’s arguments, and thus Petitioner does not establish the unpatentability of claims 5 and 6 by a preponderance of the evidence.

1. Overview of Golan (Ex. 1005)

Golan concerns a “method for continuous electronic zoom in a computerized image acquisition system,” in which the system has “a wide image acquisition device and a tele image acquisition device.” Ex. 1005, code (57). By providing “multiple image devices each with a different fixed field of view (FOV),” Golan’s system “facilitates a light weight electronic zoom with a large lossless zooming range.” *Id.* ¶ 9. Golan’s Figure 1, reproduced below, illustrates a zoom control sub-system for an image acquisition system. *Id.* ¶ 26.

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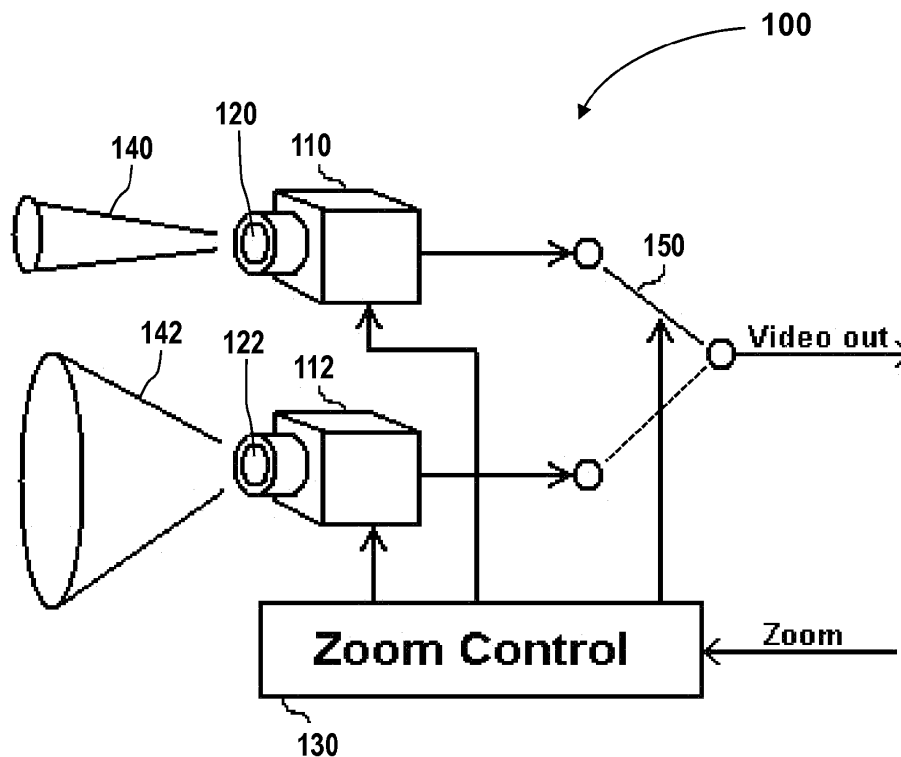


Fig 1

Figure 1 of Golan illustrates a zoom control sub-system for an image acquisition system. *Id.*

According to Golan, “[z]oom control sub-system 100 includes a tele image sensor 110 coupled with a narrow lens 120 having a predesigned FOV 140, a wide image sensor 112 coupled with a wide lens 122 having a predesigned FOV 142, a zoom control module 130 and an image sensor selector 150.” *Id.* ¶ 37. The zoom control module 130 selects a relevant image sensor through image sensor selector 150 and calculates a relevant camera zoom factor when it receives a required zoom from an operator. *Id.* ¶ 39. Golan’s system facilitates “continuous electronic zoom capabilities

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with uninterrupted imaging,” which “is also maintained when switching back and forth between adjacently disposed image sensors.” *Id.* ¶ 40.

2. Overview of Kawamura (Ex. 1007)

Kawamura concerns a “Telephoto Lens.” Ex. 1007, code (54). Kawamura’s lens is a “medium telephoto lens” that has, “for example, a lens of a focal length of about 200 mm for a screen size of 6x7 or a focal length of about 150 mm for a screen size of 4.5x6.” *Id.* at 1. The lens “keeps a compactness of an overall length to a conventional level of a telephoto ratio of about 0.96 to 0.88 but has an excellent image-formation performance due to favorably correcting spherical aberration of both a reference wavelength and color and also decreasing chromatic aberration in magnification.” *Id.* Kawamura’s Figure 1, reproduced below, illustrates one example of a lens system configuration. *Id.* at 5–6.

FIG. 1

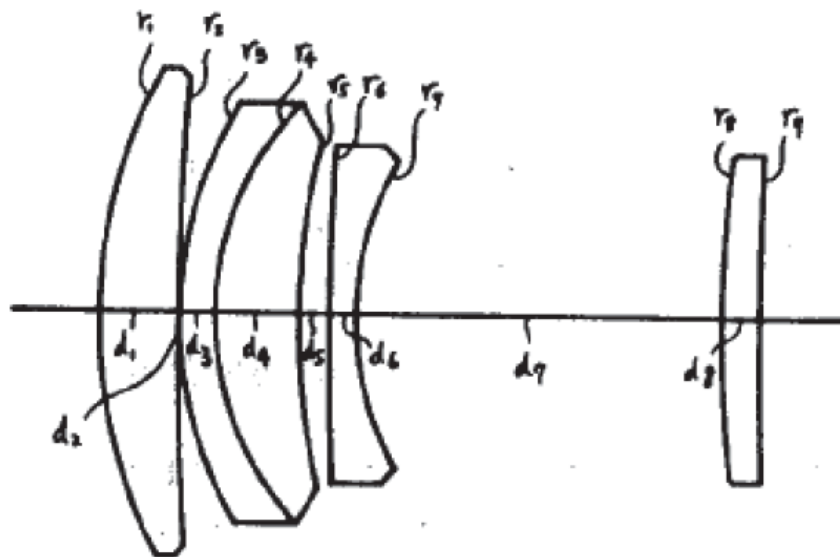


Figure 1 of Kawamura illustrates one example of a lens system configuration. *Id.*

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According to Kawamura, the inventive lens, including the example shown in Figure 1, is

a telephoto lens of a four-group, five-lens configuration of, in order from an object side, a first lens, which is a positive meniscus lens that is convex toward an object side; a second lens and a third lens, which are a laminated positive meniscus lens of a negative meniscus lens and a positive meniscus lens having a lamination surface that is convex toward the object side; a fourth lens, which is a negative lens having a rear surface with a large curvature that is concave toward an image-surface side; and a fifth lens, which is a positive lens.

Id. at 1–2.

3. *Analysis of Independent Claim 5*

Patent Owner does not contest Petitioner’s showing that the combination of Golan and Kawamura teaches or suggests the following limitations of claim 5, but argues that Petitioner has failed to show that it would have been obvious to combine these references as set forth in the Petition. *See generally* PO Resp. We summarize Petitioner’s contentions for each claim limitation to provide context for our findings and conclusion with respect to Petitioner’s rationale for combining. As explained below, we agree with Patent Owner that Petitioner has failed to show that it would have been obvious to combine Golan and Kawamura.

a) *Petitioner’s Element-by-Element Contentions*

“A zoom digital camera comprising:”

Petitioner contends that, to the extent the preamble of independent claim 5 is limiting, Golan teaches a zoom digital camera. Pet. 23. Specifically, Petitioner argues Golan’s Figure 1 embodiment discloses zoom

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control sub-system 100 that includes “a tele image sensor 110 coupled with a narrow lens 120 having a predesigned FOV 140, a wide image sensor 112 coupled with a wide lens 122 having a predesigned FOV 142, a zoom control module 130 and an image sensor selector 150.” *Id.* at 24 (quoting Ex. 1005 ¶ 37) (emphasis omitted). Petitioner explains that “[i]n Golan’s zoom control sub-system 100, each of the Wide imaging device (including wide image sensor 112 and wide lens 122) and the Tele imaging device (including tele image sensor 110 and narrow lens 120) defines an aperture for generating a corresponding digital image.” *Id.* at 25 (citing Ex. 1003 ¶ 68). Accordingly, Petitioner asserts, “Golan’s image acquisition system including a zoom control sub-system 100 is a digital camera providing digital zoom.” *Id.*

“a first imaging section that includes a fixed focal length first lens with a first field of view (FOV₁) and a first image sensor”

Petitioner contends that Golan teaches the first imaging section of independent claim 5. Pet. 25–29. Specifically, Petitioner argues Golan discloses “a first imaging section that includes a wide lens 122 (first lens) with a FOV 142 (a first field of view (FOV₁)) and a wide image sensor 112 (first image sensor).” *Id.* at 25 (citing Ex. 1005 ¶¶ 36–37, Fig. 1). Petitioner asserts that Golan’s wide lens 122 has a predesigned field of view that is fixed, and it is thus a fixed focal length lens. *See id.* at 26–29 (citing Ex. 1003 ¶¶ 72–73, 75–78; Ex. 1005 ¶¶ 9, 36–37, 43; Ex. 1016, 48).

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“a second imaging section that includes a fixed focal length second lens with a second FOV (FOV₂) that is narrower than FOV, and a second image sensor”

Petitioner contends that Golan teaches the second imaging section of independent claim 5. Pet. 30–32. Specifically, Petitioner argues Golan discloses “a second imaging section that includes a tele image sensor 110 (second sensor) coupled with a narrow lens 120 (a fixed focal length second lens) having a predesigned FOV 140 (second FOV (FOV₂)).” *Id.* at 30 (citing Ex. 1003 ¶ 79; Ex. 1005 ¶¶ 36–37, Abstract, Fig. 1). For reasons similar to those discussed with respect to Golan’s wide lens 122, Petitioner asserts Golan’s narrow lens 120, with a predesigned field of view, is a fixed focal length lens. *Id.* at 31 (citing Ex. 1003 ¶ 80; Ex. 1005 ¶¶ 9, 36–37, 43). Petitioner further asserts that Golan discloses “a FOV 140 (FOV₂) of the narrow lens 120 that is narrower than FOV 142 (FOV₁) of the wide lens 122.” *Id.* (citing Ex. 1003 ¶ 81). In particular, Petitioner points to Golan’s disclosure that “[p]referably, wide FOV 142 is substantially wider than narrow FOV 140.” *Id.* (quoting Ex. 1005 ¶ 43) (emphasis omitted).

“wherein the second lens includes five lens elements along an optical axis starting from an object starting with a first lens element with positive power, wherein the five lens elements further include a second lens element with negative power, a fourth lens element with negative power and a fifth lens element”

Petitioner contends that the combination of Golan and Kawamura renders obvious the lens element arrangement of the second lens of independent claim 5. Pet. 32–37. Specifically, Petitioner argues that Kawamura discloses a number of examples of a fixed focal length tele lens

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having five lens elements as arranged in the claim. *Id.* at 33 (citing Ex. 1003 ¶ 84). Petitioner asserts Kawamura's Figure 1 shows five lens elements, which Petitioner labels L1–L5, where L1 is a positive meniscus lens; L2 and L3 are respective negative and positive meniscus lenses and are combined to form a laminated positive meniscus lens; L4 is a negative lens; and L5 is a positive lens. *Id.* at 33–36 (citing Ex. 1003 ¶¶ 85–89; Ex. 1007, 1, 5, Fig. 1).

“wherein a largest distance between consecutive lens elements along the optical axis is a distance between the fourth lens element and the fifth lens element” and

“wherein a ratio of a total track length (TTL) to effective focal length (EFL) of the second lens is smaller than 1”

Petitioner contends the combination of Golan and Kawamura renders obvious the independent claim 5 feature of a largest distance between consecutive lens elements being between the fourth and five lens elements. Pet. 37–41. Petitioner argues that Kawamura's Figure 1 shows that the distance d7 between the lenses Petitioner labels as L4 and L5 is the largest distance among all the respective distances between consecutive lenses in Figure 1. *Id.* at 38–40 (citing Ex. 1003 ¶¶ 95–97; Ex. 1007, 3).

Petitioner further contends that the combination of Golan and Kawamura renders obvious the total track length to effective focal length ratio feature of independent claim 5. *Id.* at 41–44. Petitioner argues that “Kawamura's telephoto lens ‘keeps a compactness of an overall length to a conventional level of a telephoto ratio of about 0.96 to 0.88.’” *Id.* at 41 (quoting Ex. 1007, 1) (citing Ex. 1003 ¶ 103). Petitioner further argues that “[a] POSITA would have understood that a telephoto ratio of Kawamura is a

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ratio of total track length (TTL)/effective focal length (EFL).” *Id.* (citing Ex. 1003 ¶ 103; Ex. 1006, 169).

b) Rationale for Combining Golan and Kawamura

Petitioner presents two alternative theories—a first alternative theory in which scaling is not involved in the combination of Golan and Kawamura and a second alternative theory in which the combination involves scaling. *See* Pet. 20–23.

(1) Petitioner’s Contentions in the Petition Regarding its First Alternative Theory

Petitioner contends that a person of ordinary skill in the art would have been motivated to apply Kawamura’s teachings to Golan “to produce the obvious, beneficial, and predictable results of a digital camera including a tele lens with a compactness of an overall length while having an excellent image-formation performance as taught by Kawamura.” Pet. 20 (citing Ex. 1003 ¶¶ 60–64). Petitioner supports its contention by arguing that “Golan recognizes that a typical camera with a large dynamic zoom range ‘requires heavy and expensive lenses, as well as complex design,’ and has a goal to provide an imaging device with ‘light weight’ electronic zoom.” *Id.* at 21 (quoting Ex. 1005 ¶¶ 7–8). Petitioner further contends that “Golan recognizes the need to provide excellent image quality by providing ‘lossless electronic zoom’ for maintaining the desired resolution and by providing ‘continuous electronic zoom with uninterrupted imaging.’” *Id.* (quoting Ex. 1005 ¶ 4, Abstract) (citing Ex. 1003 ¶ 62). Petitioner also contends that Kawamura addresses these needs identified in Golan by providing “a telephoto lens that ‘keeps a compactness of an overall length to a conventional level of a telephoto ratio of about 0.96 to 0.88 but has an

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excellent image-formation performance.” *Id.* (quoting Ex. 1007, 1) (citing Ex. 1003 ¶ 62) (emphases omitted). The resulting system, Petitioner argues, “would have been no more than the combination of known elements according to known methods (such as modifying the tele lens 120 in [the] zoom control subsystem of Golan according to Kawamura’s teachings). . . .” *Id.* at 22. Dr. Sasián testifies that “combining the teachings of Kawamura with the system of Golan would have produced operable results that are predictable.” Ex. 1003 ¶ 63.

(2) *Petitioner’s Contentions in the Petition
Regarding its Second Alternative Theory*

Petitioner alternatively contends that “[t]o the extent that modifications would have been needed in order to accommodate the teachings of Kawamura in the system of Golan,” “a POSITA would have scaled the Kawamura lens prescriptions to fit into a digital camera of Golan . . .” Pet. 22–23. Specifically, Dr. Sasián testifies that “lens scaling was a well-known practice in lens design, and a POSITA would have scaled the Kawamura lens prescriptions to fit into a digital camera of Golan while maintaining the compactness and an excellent image-formation performance.” Ex. 1003 ¶ 64 (citing Ex. 1006, 57; Ex. 1009, 254–355). The cited evidence includes “Modern Lens Design: A Resource Manual,” by Warren J. Smith (Ex. 1006), and “ZEMAX Optical Design Program User’s Manual” (Ex. 1009). *See* Ex. 1006, 57 (discussing how “[a] lens prescription can be scaled to any desired focal length simply by multiplying all of its dimensions by the same constant” and that “[a]ll of the *linear* aberration measures will then be scaled by the same factor”); Ex. 1009, 254–255 (with respect to “scale lens,” stating that “scale will scale the entire lens

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by the specified factor,” and that “[t]his useful for scaling an existing design to a new focal length, for example.”).

c) Patent Owner Contentions Regarding Petitioner’s Rationale for Combining

Patent Owner contends that a person of ordinary skill in the art would not have been motivated to combine Golan and Kawamura. PO Resp. 32–53.

With respect to Petitioner’s first alternative theory that combining Golan and Kawamura does not require scaling, Patent Owner argues “the goal in Golan was to avoid ‘heavy and expensive lenses’ and to achieve ‘light weight electronic zoom.’” *Id.* at 32 (Ex. 1005 ¶¶ 7–9). Patent Owner further contends that, “[i]n the context of camera design, the 7-inch Kawamura lenses would have been considered ‘heavy,’ both in 1981 when Kawamura was filed and in 2009 on Golan’s asserted priority date.”⁶ *Id.* (Ex. 2003 ¶ 74). Patent Owner bases its position on “the fact that Golan contemplates use of 5 megapixel digital sensors,” which it asserts “commonly had dimensions of 2.7 mm x 3.6 mm or 3.6 mm x 4.8 mm, [which are] much smaller than the 56 mm x 67 mm film size Kawamura’s lenses were designed for.” *Id.* at 33 (citing Ex. 2003 ¶ 75; Ex. 2007, 4).

⁶ Patent Owner’s reference to 2009 as the relevant time frame for the obviousness analysis appears to be in error. The face of the ’408 patent shows a provisional application filed on June 13, 2013. Ex. 1001, code (60); *compare id.*, with Ex. 2003, 15 (Dr. Moore relying on June 13, 2013, as the effective filing date). As explained above, we do not expressly determine the priority date for the ’408 patent to render the conclusions in this Decision. We rely on June 13, 2013, as the earliest *possible* priority date for the ’408 patent.

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With respect to Petitioner’s second alternative theory that the combination of Golan and Kawamura involves scaling Kawamura’s lens assembly, Patent Owner contends that “scaling [a lens] design will also scale the aberrations of the design and leave many dimensionless properties of the lens design unchanged[;] that does not mean that the resulting design will be practical or useful.” *Id.* at 34–35 (citing Ex. 2003 ¶ 78). Patent Owner supports its position in part with an article titled “Optical Analysis of Miniature Lenses with Curved Imaging Surfaces” co-authored by Dr. Sasián and his student Dmitry Reshidko, which discloses that “[a] traditional objective lens can not [sic] be simply scaled down as a lens solution due to fabrication constraints, materials[’] properties, manufacturing process[es], light diffraction and geometrical aberrations.” *Id.* at 35–36 (quoting Ex. 2008, 1). Patent Owner also points to the Ph.D. dissertation of Dr. Sasián’s student Yufeng Yan, which according to Patent Owner discloses

“that the design approaches and lens constructions are significantly different between a miniature camera lens and a conventional camera lens” and that “if the conventional camera lens was simply scaled down to the same focal length of the miniature lens, it would encounter many issues.” Yan further explained: “[s]caling down a conventional camera lens requires spatial tolerances to scale down with the same ratio, which is about the factor of 7. This creates a huge problem on the tolerance budget of element and surface decenter.”

PO Resp. 36–37 (quoting Ex. 2013, 79, 83).

Patent Owner also cites to a Society of Photo-optical Instrumentation Engineers (SPIE) article by Bureau et al., “The Optics of Miniature Digital Camera Modules” (Ex. 2012, “Bureau”). *Id.* at 37 (citing Ex. 2012, 1, 3). Bureau was cited in a textbook authored by Dr. Sasián, “Introduction to Lens Design” (Ex. 2006, 195), and relied upon by Petitioner in another

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proceeding challenging another patent assigned to Patent Owner (IPR2018-01146, Ex. 1012) in which Dr. Sasián provided expert testimony. Bareau discloses that

When designing a camera module lens, it is not always helpful to begin with a traditional larger-scale imaging lens. Scaling down such a lens will result in a system that is unmanufacturable. . . . For glass elements, the edge thicknesses will become too thin to be fabricated without chipping. To achieve a successful design we have to modify our lens forms and adjust the proportions of the elements.

Ex. 2012, 1.

d) Petitioner's Responsive Contentions Regarding its Reasons for Combining

First, Petitioner argues that Golan's teachings are not limited to miniature cameras or sensors such as those used in mobile devices and thus, would have been understood by a POSITA to "apply to imaging systems of various sizes using any suitable image sensors." Pet. Reply 8 (citing Ex. 1013 ¶ 16) (arguing Golan's teachings also "include applications for conventional digital still cameras and other commercial, industrial and security applications including air-born vehicles/drones applications"). In support of its position that Golan's teachings "do[] not establish a dimension limitation on either its imaging system or image sensors," Petitioner cites to products and patents of the inventors and the assignee of Golan, NextVision Stabilized Systems, Ltd. ("NextVision"), that purportedly "confirm" "the applicability of Golan's teachings to applications beyond the mobile device realm." Pet. Reply 8.

Second, Petitioner argues that

Patent Owner's arguments should be rejected because they improperly rely on Golan's example 5-Megapixel image sensor

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as a requirement, because they fail to recognize that a POSITA would have used other sensors (e.g., of different megapixel number or different dimensions) in Golan's systems, and because scaling to accommodate a sensor size was practical and with the skill of a POSITA, as demonstrated by Dr. Sasián.

Id. at 10 (citing Ex. 1013 ¶ 18). Petitioner further characterizes Patent Owner's expert's testimony as "admit[ting] that lightweight cameras may be used in applications including drones, endoscope applications, and space applications, without using miniature lenses as defined in the context of cellphone." *Id.* at 13 (citing Ex. 1017, 143:16–145:19, 148:16–19).

Third, Petitioner argues that a "POSITA would have understood that, in Golan, the terms 'heavy,' 'expensive,' and 'light weight' are relative." *Id.* at 13 (citing Ex. 1013 ¶ 25). Petitioner explains that

Golan describes that a camera with a single optical zoom lens having a large dynamic zoom range typically requires "heavy and expensive lenses." An example of such a heavy and expensive lens is a Fujinon A36X14.5 lens, an optical zoom lens providing a zoom ratio of 36x. The Fujinon A36X14.5 lens is heavy with a weight of 4.58kg (about 10 pounds) and a length of 363.3 mm (about 14.3"), and is expensive (e.g., a used one priced on eBay for over \$10,000).

....

. . . [C]ompared to a camera with a single Fujinon A36X14.5 lens, according to Golan's teachings, a POSITA could and would have achieved light weight digital zoom of 36x by using a wide lens and a telephoto lens (e.g., based on Kawamura's lens design) that are cheaper and lighter than the Fujinon A36X14.5 lens. As such, Golan does not require using 1/4" or 1/3" miniature digital sensors to achieve a cheaper lightweight digital zoom.

Pet. Reply 12–13 (Ex. 1005 ¶ 7; Ex. 1028, 1; Ex. 1027, 1; Ex. 1013 ¶ 23).

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Fourth, Petitioner contends that “Patent Owner’s analysis is incorrect because it is based on a POSITA’s understanding of technology in 1981 and incorrect understanding of ongoing relevance of older lens designs.” *Id.* at 20 (emphasis omitted). Petitioner characterizes Patent Owner’s argument as “imply[ing] that designs from 1981 would be wholly outdated by 2013,” and asserts that “lens designs remain relevant designs to a POSITA for many decades.” *Id.* at 21 (citing Ex. 1013 ¶ 39; Ex. 1025, 359–366 (textbook titled “Modern Lens Design” from 2005 allegedly including example telephoto lens designs from 1950, 1977, and 1982)). Petitioner further argues that “[b]ecause Patent Owner incorrectly relies on a[] POSITA’s knowledge of the technology in 1981, [Patent Owner] fails to consider the ongoing relevance of older lens designs with modern lens design, and fails to evaluate prior art as a POSITA at the time the invention was made” *Id.*

e) Analysis of Rationale for Combining

For the reasons that follow, we determine that Petitioner’s rationale for combining Golan and Kawamura, under either its first alternative theory or its second alternative theory, is not supported by sufficient rational underpinning.

(1) Petitioner’s First Alternative Theory Without Scaling

We are not persuaded that Petitioner’s evidence sufficiently supports its rationale for combining Golan and Kawamura and a finding that one of ordinary skill in the art at the time of the earliest priority date of *the ’408 patent* would have understood Kawamura’s lens assembly to have “compactness of an overall length” such that Kawamura’s lens assembly would have been understood to address the needs identified in Golan and its

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“goal to provide an imaging device with ‘*light weight*’ electronic zoom,” as Petitioner contends. Pet. 20–21 (quoting Ex. 1005 ¶¶ 7–8; Ex. 1007, 1) (citing Ex. 1003 ¶¶ 60–64) (emphases added).

With regard to Petitioner’s *first* argument, there is insufficient evidence of record to support the proposition that Golan’s teachings are applicable to imaging systems that are of a scale larger than that of the miniature cameras and image sensors used in mobile devices. According to Petitioner, a “POSITA’s understanding of the applicability of Golan’s teachings to applications beyond the mobile device realm is confirmed by other disclosures from Golan’s inventors and assignee, NextVision. . . .” Pet. Reply 8 (citing Ex. 1013 ¶ 17). Petitioner then cites exhibits and patents purporting to show products of the assignee of Golan, NextVision. Pet. Reply 8–9 (citing Exs. 1022, 1024, 1026, 1030, 1034, 1035). Dr. Sasián’s testimony in paragraph 17 of his Reply Declaration also relies on these exhibits and patents. Ex. 1013 ¶ 17; *see id.* ¶¶ 21, 28 (citing Exs. 1029, 1031, 1032).

As an initial matter, the fact that the assignee of the Golan reference produces products having imaging systems of varying sizes does not, without more, suggest that Golan’s teachings, specifically, are applicable to these products or vice versa.⁷ *Cf. Abbott Labs. v. Dey, L.P.*, 287 F.3d 1097, 1104 (Fed. Cir. 2002) (finding the relationship between

⁷ We do not discern that an assignee’s products would be relevant to the scope of a patent that is not asserted to cover those products and does not discuss those products in its specification. *Cf. See Astrazeneca AB v. Mut. Pharm. Co.*, 384 F.3d 1333, 1340 (Fed. Cir. 2004) (discussing disavowal of claim scope through criticism of other products in the general summary or description of the invention).

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two unrelated patents, although having common subject matter, a common inventor, and *the same assignee*, “insufficient to render particular arguments made during prosecution of [one of the patents] equally applicable to the claims of [the other patent]”). In fact, these exhibits regarding NextVision’s products do not sufficiently establish—either alone or in combination with Dr. Sasián’s testimony—that a person of ordinary skill in the art would have understood from the exhibits that Golan’s teachings apply to image sensors, imaging systems, and lens assemblies of all sizes.

Dr. Sasián’s reliance on the exhibits is conclusory. *See, e.g.*, Ex. 1013 ¶¶ 16, 17, 21, 28. Dr. Sasián’s testimony regarding the exhibits simply lists them, describes their subject matter, and concludes that they confirm “the applicability of Golan’s teachings to applications other than only mobile devices” *Id.* ¶ 17. Below we provide a summary of the references relied on by Petitioner and Dr. Sasián in order to support our finding that none of the exhibits adequately support Petitioner’s contentions and Dr. Sasián’s testimony as to Golan and its purported applicability to image sensors, imaging systems, and lens assemblies of all sizes.

Exhibit 1022 is U.S. Patent No. 8,896,697 B2 to Golan et al. (“Golan ’697”) and is titled “Video Motion Compensation and Stabilization Gimbaled Imaging System.” Ex. 1022, codes (76), (54). Golan ’697 discloses as its field of invention “an imaging system, operatively mounted on an air-born vehicle, that can transmit high resolution images of a selected region of interest, whereas the images are continuously compensated for vehicle motion.” *Id.* at 1:14–18.

Exhibit 1024 is an article titled “IAI [(Israel Aircraft Industries)] Unveils the Ghost – a Miniature UAV [(Unmanned Aerial Vehicle)] For

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Special Operations” by Tamir Eshel dated August 8, 2011 (“Eshel”). It depicts “twin rotors [that] create adequate lift within a relatively small diameter (0.75 cm/2.46 ft), enabling the Ghost [UAV] to navigate safely near obstacles, enter through windows and hover inside built-up areas or penetrate dense vegetation.” Ex. 1024, 1–2.

Exhibit 1026 is a screen capture of NextVision’s website and product MicroCam-D, an aerial photography camera. Ex. 1026, 1. It describes MicroCam-D as being 4.6 ounces and capable of performing digital zoom. *Id.* at 2. It also includes images of other NextVision products such as drone detection cameras, optical emission cameras, and other aerial photography cameras. *Id.* at 3–5.

Exhibit 1029 is a product manual for Kodak’s EasyShare V610 dual lens digital camera (“Kodak EasyShare”) which Dr. Sasián cites to show that “[a] POSITA would have understood that image sensors of different dimensions, for example, a 1/2.5” sensor, may be used in Golan,” and contends that Kodak EasyShare has “a dual lens digital camera to provide a 5.3-megapixel image.” Ex. 1013 ¶ 21.

Exhibit 1030 is an article from a global news service, Unmanned Aircraft Systems (UAS) Vision, titled “Lightweight UAS Demand Accelerates Development of Lightweight Payloads.” The article describes how the “near future . . . will see smaller payloads achieved within radar[,] laser[,] and thermal systems” on the order of less than 100 grams. Ex. 1030, 3. The article expresses that such developments “are causing a change in the operational concept of UAS.” *Id.*

Exhibit 1031 is U.S. Patent No. 8,462,209 B2 to Sun and is titled “Dual-swath Imaging System” (“Sun”). It discloses “[a] portable, aerial,

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dual-swath photogrammetric image system comprising twin nadir pointing CCD cameras for simultaneously acquiring twin adjacent digital images for merging into a large panorama.” Ex. 1031, codes (54), (57). Sun further discloses “a first lens shift mount . . . for physically shifting [a] first large format optical lens” and “a second lens shift mount . . . for shifting the focal point of said second large format optical lens” *Id.* at 10:32–38, 10:47–54.

Exhibit 1032 is U.S. Patent No. 7,974,460 B2 to Elgersma and is titled “Method and System for Three-dimensional Obstacle Mapping for Navigation of Autonomous Vehicle” (“Elgersma”). Ex. 1032, code (54). Elgersma discloses “an autonomous vehicle with an image capturing device, and focusing the image capturing device at a predetermined number of different specified distances to capture an image at each of the specified distances.” *Id.* at code (57). Dr. Sasián cites Sun and Elgersma in support of the testimony that “a POSITA would have used image sensors of various dimensions, including sensors with sizes similar to a film size of Kawamura, that are suitable for applications,” specifically, unmanned aerial vehicles. Ex. 1013 ¶ 28 (citing Ex. 1031, 2:31–45; Ex. 1032, 1:10, 1:25–26).

Exhibit 1034 is a video capture showing navigation to and through NextVision’s website as of September 2, 2012, using the Internet Archive’s Wayback Machine. The video capture shows footage shot by NextVision’s MicroCam-D product. The video appears to show the MicroCam-D camera zooming in on targets and is annotated with the caption “digital zoom” at various points, in particular, at approximately 1:45 minutes.

Exhibit 1035 is a screen capture of a profile for NextVision describing the company as privately owned and “focusing on development and

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production of Electro-Optical stabilized payload and solid state digital cameras for day and night observation.” Ex. 1035, 1. It describes NextVision’s MicroCam-D product as the world’s first sub 100-gram, gyro-stabilized payload. *Id.*

Petitioner does not point to any portion of these exhibits that mentions Golan or the invention described therein. *See generally* Pet. Reply. Nor does Petitioner point to evidence that sufficiently addresses the applicability of Golan’s specific teachings to any particular product or imaging system described in the cited exhibits. *Id.* Dr. Sasián’s Reply Declaration does not offer perspective or sufficient explanation as to how a POSITA would have understood these exhibits to support his testimony and conclusions. In particular, Petitioner does not show sufficiently that the imaging systems in *any* of these exhibits achieve “light weight electronic zoom” using “two fixed focal length lenses and ‘two (or more) image sensors, having different fixed FOVs’” “with a large lossless zooming range,” as Dr. Sasián testifies that Golan teaches. Ex. 1013 ¶ 24 (citing Ex. 1005 ¶ 9). Below, we explain why Dr. Sasián’s testimony—which mostly touches on Golan ’697 and MicroCam-D—is insufficient to support a finding that any alleged multiple image sensors in Golan ’697 or alleged digital zoom capability in NextVision’s MicroCam-D described in Exhibits 1026 and 1034 correspond to the specific device and method taught by Golan.

During his deposition, with respect to the disclosure of “a high resolution image sensor” and “a multi-megapixel CMOS” in Golan ’697 (Ex. 1022), Dr. Sasián testified that the “optical zoom” in Golan ’697 “could refer to either a single lens or two lenses” and cited its claim 27 as support for the proposition that Golan ’697 discloses “one or more image sensor

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arrays.” Ex. 2015, 97:4–8, 98:18–99:10. However, Dr. Sasián stopped short of concluding that Golan ’697 teaches “two fixed focal length lenses” and “two (or more) image sensors, having different FOVs” as he does with Golan (Ex. 1013 ¶ 24):

MR. RUBIN: So would you agree that the Golan ’697 patent, Exhibit 1022, never says to use sensors having different angles of view in order to provide a zoom?

MS. SHI: Objection. Out of the scope of the declaration.

DR. SASIÁN: Well, I cannot -- At this moment, I cannot find a mention of different fields of view.

Ex. 2015, 99:14–22. Accordingly, Dr. Sasián’s testimony demonstrates that he has not affirmatively testified that Golan ’697 teaches sensors having different FOVs, which the accompanying objection of Petitioner’s counsel further supports. *Id.* Independent from this deposition testimony, a review of Dr. Sasián’s Second Declaration confirms that Dr. Sasián did not testify on whether Golan ’697 has different fields of view, and further, whether any exhibit has “light weight electronic zoom” using “two fixed focal length lenses and ‘two (or more) image sensors, having different fixed FOVs’” “with a large lossless zooming range,” as Dr. Sasián testifies that Golan teaches. *See generally* Ex. 1013; Ex. 1013 ¶ 24 (citing Ex. 1005 ¶ 9).

With respect to the exhibits describing NextVision’s MicroCam-D product, Dr. Sasián testified that MicroCam-D “may include more than one camera as the specifications teach camera in plural, cameras.” *Id.* at 93:2–5. Dr. Sasián further testified that he did not know whether MicroCam-D utilized a mechanical zoom, and consequently stopped short of determining that MicroCam-D includes “two fixed focal length lenses” and “two (or more) image sensors, having different FOVs” as he did with Golan. *Id.* at

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95:2–11; *compare id. with*, Ex. 1013 ¶ 24. When asked about the specific relevance of MicroCam-D to Golan, Dr. Sasián testified as follows:

MR. RUBIN: What does the MicroCam-D have to do with the Golan patent that you rely on as prior art in this IPR?

DR. SASIÁN: Well, the point I’m bringing up is that there are applications where Golan’s disclosure may be relevant, may be applicable. That is the point.

Ex. 2015, 91:6–11.

During his deposition, Dr. Sasián did not rule out using mechanically moving parts to achieve optical zoom in MicroCam-D, which is a subject of multiple exhibits cited by Petitioner. *Id.* at 94:15–95:10. We consider this inquiry relevant to whether Dr. Sasián testifies that any of the exhibits have “light weight electronic zoom” using “two fixed focal length lenses and ‘two (or more) image sensors, having different fixed FOVs’” because mechanically moving parts are something Golan avoids with its two fixed focal length lenses having different fields of view. Ex. 1013 ¶ 24 (citing Ex. 1005 ¶ 9); 1005 ¶¶ 7–9. As Dr. Moore explains,

Traditionally, zoom capability was provided using mechanical optical zooming, moving lens elements relative to each other to change the focal length, and thus the magnification of the lens. Mechanical optical zoom lenses are generally more expensive and larger than fixed focal length lenses. Another approach to zoom is digital zooming, where a digital processor provides a magnification effect by cropping the image from a fixed focal length lens and interpolating between the pixels to create “a magnified but lower-resolution image.”

An alternative to both mechanical and traditional digital zoom is described in the ’408 patent. In the ’408 patent, an improved digital zoom is provided using a “dual-aperture” configuration.

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Ex. 2003 ¶¶ 28, 29 (citing Ex. 1001, 1:45–49; 1:54, 3:30–32). Even with respect to the exhibits disclosing digital zoom cited by Petitioner after our Institution Decision, the record does not sufficiently support a finding that there is any disclosure of two image sensors that have different fields of view with fixed focal length lenses. *See, e.g.*, Ex. 2015, 99:14–22.

Petitioner also does not make any such representations in its Reply. *See generally* Pet. Reply.

For the reasons discussed above, and particularly with respect to the digital zoom capability of the MicroCam-D camera described in Exhibits 1026 and 1034, the record does not contain sufficient evidence to support a finding that this capability corresponds to the specific method taught by Golan. Nor does the record sufficiently establish that the digital zoom method taught by Golan would have been understood by a POSITA to be the only method—or even one of a few methods—conceivably applicable to MicroCam-D or any other imaging system described in the exhibits cited by Petitioner, to provide the asserted functionality. Petitioner does not explain adequately why we should interpret Golan based on extrinsic evidence that does not “link” the teachings of Golan with any NextVision product or invention. As discussed above, we find Petitioner’s contentions and Dr. Sasián’s testimony conclusory.

With regard to Petitioner’s *second* responsive contention, Petitioner characterizes Patent Owner’s argument as limiting the teachings of Golan to the disclosed 5 megapixel image sensor array. Pet. Reply 10–11. We do not agree with Petitioner’s characterization of Patent Owner’s argument. We understand Patent Owner’s reference to the 5 megapixel image sensor array disclosed in Golan as providing the only context in the record for the scale

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of device or device components to which Golan's teachings are applied. PO Resp. 8–9; Ex. 1005 ¶ 4. The disclosure of the 5 megapixel image sensor array in Golan supports the finding that Golan is at least applicable to miniature digital cameras and image sensors such as those used in mobile devices. Ex. 1005 ¶ 4. As discussed above, there is no disclosure or evidence that discloses that Golan's teachings are applicable to larger-scale imaging systems, nor is there evidence of record that sufficiently supports a finding that a POSITA would have understood Golan's teachings to be applicable to larger-scale imaging systems, such as those of the size able to accommodate a lens assembly of size disclosed in Kawamura.

With regard to Petitioner's *third* responsive contention that a "POSITA would have understood that, in Golan, the terms 'heavy,' 'expensive,' and 'light weight' are relative," the record does not support a finding that a POSITA would have understood these terms to be relative to a lens assembly of the size taught by Kawamura or of the size of the Fujinon lens. the 5 megapixel image sensor array is the only disclosure in Golan which might indicate to a POSITA what scale of lens assembly Golan's teachings would be applicable to. *Id.* Instead, we determine that a POSITA would have understood these terms to be relative to what is disclosed in Golan, which is a miniature digital camera, and correspondingly-sized image sensors (e.g., 1/4" or 1/3" miniature digital sensors). *See* Ex. 2003 54 (Dr. Moore testifying that a "POSITA . . . in 2013, would have understood that a 5 megapixel sensor was likely to be a 1/3-inch or 1/3-inch sensor")

With regard to Petitioner's *fourth* responsive contention that Patent Owner improperly discounts Kawamura's teachings as no longer relevant as of Golan's priority date because Patent Owner is relying on the level of skill

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in the art as of Kawamura’s priority date of 1981, we do not view Patent Owner’s arguments in the same way. Petitioner is correct in that the relevant level of skill in the art is *not* the timeframe associated with Kawamura—what constitutes “lightweight” or “compact” must be evaluated through the eyes of a POSITA as of the priority date of the ’408 patent. We understand Petitioner to take the position that Kawamura’s lens assembly is lightweight compared to some other lens assemblies—like the nearly ten pound Fujinon A36X14.5 lens. As discussed above, even assuming, *arguendo*, that “lightweight” is a relative term, Petitioner does not present sufficient evidence that a POSITA at the time of the priority date of the ’408 patent (which could be as early as June 13, 2013 (*see* Ex. 1001, code (60))) would have thought of Kawamura’s 7-inch lens assembly as “lightweight” or “compact”—particularly in the absence of any size or weight-related information for comparison in Golan and Golan’s disclosure of only a “5 megapixel image sensor array” (*see* Ex. 1005 ¶ 4).

(2) *Petitioner’s Second Alternative Theory with Scaling*

We are not persuaded that Petitioner’s evidence sufficiently supports its rationale for combining Golan and Kawamura and a finding that one of ordinary skill in the art at the time of the earliest priority date *of the ’408 patent* would have understood Kawamura’s lens assembly to be compact in length or that Kawamura’s lens assembly would have been understood to address the needs identified in Golan and Golan’s “goal to provide an imaging device with ‘*light weight*’ electronic zoom,” as Petitioner contends (*supra* §§ III.D.3.e.1), particularly if it would have been necessary to scale Kawamura’s lens assembly in order to modify Golan’s teachings in

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Petitioner’s proposed combination. Pet. 20–23 (quoting Ex. 1005 ¶¶ 7–8; Ex. 1007, 1) (citing Ex. 1003 ¶¶ 60–64) (emphasis added). We are further not persuaded that a “POSITA would have scaled the Kawamura lens prescriptions to fit into a digital camera of Golan while *maintaining the compactness* and an excellent image-formation performance.” Ex. 1003 ¶ 64 (citing Ex. 1006, 57; Ex. 1009, 254–355) (emphasis added).

We credit the testimony of Dr. Moore that a person of ordinary skill in the art would not have been motivated to scale Kawamura for use in Golan. *See, e.g.*, PO Resp. 33–34 (citing Ex. 2003 ¶ 76). Dr. Moore’s testimony is supported by the 28-year difference between the Golan and Kawamura inventions and the resulting improvement in performance over decades-earlier, high-quality lenses. *Id.* Dr. Moore also explains that the “Kawamura lens would need to be scaled down by a factor of around 14x to 20x in order provide the same field of view” as Golan. Ex. 2003 ¶ 77 (citing Ex. 2005, 47:24–48:3 (Dr. Moore testifying that Dr. Sasián agrees, in his deposition testimony, with a scaling factor of at least 10)).

We also credit Dr. Moore’s testimony that “[a] POSITA would not have been motivated to go beyond [the] rich literature of miniature lens designs and try scaling old lenses, designed for different purposes, with little reason to expect the result would be manufacturable.” Ex. 2003 ¶ 87. Moreover, Patent Owner has impeached Dr. Sasián’s testimony by pointing to positions he has accepted in the past that contradict his testimony in the present proceeding. For example, Dr. Sasián’s testimony that the combination of Golan and Kawamura would have been understood to be scalable is contradicted by his article that states that a POSITA would have been dissuaded from scaling a conventional camera lens or traditional

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objective lens due to “fabrication constraints, materials['] properties, manufacturing process[es], light diffraction and geometrical aberrations.”

Ex. 2008, 1. Neither Petitioner nor Dr. Sasián sufficiently explains the contradiction; *see also* Ex. 2013, 79, 83 (Dr. Sasián’s student’s Ph.D. dissertation discussing issues associated with scaling down a conventional lens and required spatial tolerances). Bareau, an article cited in one of Dr. Sasián’s textbooks (Ex. 2006, 195), also discusses manufacturing and fabrication constraints with regard to scaling “a traditional larger-scale imaging lens.” Ex. 2012, 1.

(3) *Remainder of Petitioner’s Reasons for
Combining Golan and Kawamura*

The remainder of Petitioner’s reasons for combining are also insufficient to support a conclusion of obviousness. For example, Petitioner’s contentions that Golan and Kawamura are analogous art, share a common objective, and would have produced operable results that are predictable are insufficient to support a conclusion of obviousness. Pet. 20–22 (arguing that “the references are analogous prior art and are in the same field of endeavor pertaining to imaging systems including a telephoto lens,” that “they share a need to provide a compact and light weight imaging system while providing excellent image [quality],” and that the combination “would have been no more than the combination of known elements according to known methods”).

Although yielding predictable results can, in some situations, sustain a conclusion of obviousness, Petitioner’s contention of predictable results is too generic and not sufficiently explained or supported to sustain a conclusion of obviousness. *See In re Kahn*, 441 F.3d 977, 988 (Fed. Cir.

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2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”).

During the hearing, Patent Owner’s counsel noted that “you don’t necessarily have to show that that combination would be best, but you do have to provide a motivation to combine with a particular reference.” Tr. 44:5–10. We take this opportunity to clarify that we are not requiring Petitioner to point out why Kawamura teaches a better telephoto lens than that of the universe of other telephoto lens assemblies. Patent Owner contends—and Petitioner disputes—that there was a “sea” of telephoto lens patents as of the relevant timeframe. Whether or not there were a “sea” as Patent Owner contends, there were more than a small number of predictable solutions, which even Petitioner’s declarant acknowledges. *See* Ex. 2015, 114:14–18 (Dr. Sasián’s testimony acknowledging there were several, well-known “lens designs that were publicly known for telephoto and miniature cameras” during the relevant timeframe). We further note that there is insufficient evidence of record to support a finding that a POSITA would have understood that there were only a few options for telephoto lens designs from which to choose such that Kawamura’s lens assembly would have been the “obvious” choice. *Cf. Procter & Gamble Co. v. Teva Pharm. USA, Inc.*, 566 F.3d 989, 996 (Fed. Cir. 2009) (“When a person of ordinary skill is faced with ‘a finite number of identified, predictable solutions’ to a problem and pursues ‘the known options within his or her technical grasp,’ the resulting discovery ‘is likely the product not of innovation but of ordinary skill.’”).

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Petitioner argues that the term “conventional” in Kawamura refers to the telephoto ratio and not the “compactness of an overall length.” Pet. Reply 18–19 (citing Ex. 1007, 1). Even assuming, *arguendo*, that the term “conventional” as disclosed in Kawamura does not apply to the length of Kawamura’s lens assembly and instead applies only to Kawamura’s telephoto ratio, that still would not alter our finding that a POSITA would not have considered Kawamura to disclose a “lightweight” or “compact” lens assembly as of the earliest priority date of the ’408 patent. We are not persuaded for the same reason discussed above, that in the absence of a comparison between two imaging systems of differing sizes in Golan, the record supports a finding that “lightweight” would have been understood to refer to a larger-scale imaging system capable of accommodating a lens assembly of the size disclosed in Kawamura.

For the foregoing reasons, we are not persuaded that Petitioner’s rationale for combining Golan and Kawamura is supported by sufficient rational underpinning. As such, we conclude that Petitioner has not shown by a preponderance of the evidence that independent claim 5 is unpatentable over the combination of Golan and Kawamura.

4. *Analysis of Dependent Claim 6*

As Petitioner’s arguments for dependent claim 6 rely on the same rationale for combining as presented with respect to independent claim 5, we conclude that Petitioner has not established by a preponderance of the evidence that dependent claim 6 is unpatentable under 35 U.S.C. § 103 over the combination of Golan and Kawamura.

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E. Petitioner's and Patent Owner's Objections to Demonstratives

Petitioner objects to various slides in Patent Owner's demonstratives for the oral hearing. Paper 29. Patent Owner objects to various slides in Petitioner's demonstratives for the oral hearing. Paper 30. As we do not rely on the demonstratives to reach the conclusion rendered in this Decision, we do not address either party's objections. Both Petitioner's and Patent Owner's objections to the demonstratives are dismissed as moot.

IV. CONCLUSION

For the foregoing reasons, we conclude that Petitioner has not established by a preponderance of the evidence that claims 5 and 6 of the '408 patent are unpatentable. In summary:

Claim(s)	35 U.S.C. §	References/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
5, 6	103	Golan, Kawamura		5, 6
Overall Outcome				5, 6

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 5 and 6 of the '408 patent have not been shown to be unpatentable;

FURTHER ORDERED that Petitioner's objections to the demonstratives are dismissed as moot;

FURTHER ORDERED that Patent Owner's objections to the demonstratives are dismissed as moot; and

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FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Paper 41
Entered: July 27, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

COREPHOTONICS, LTD.,
Patent Owner.

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U.S. Patent 10,015,408 B2

Before GREGG I. ANDERSON, MONICA S. ULLAGADDI, and
JOHN R. KENNY, *Administrative Patent Judges*.

ULLAGADDI, *Administrative Patent Judge*.

DECISION

Denying Petitioner's Request on Rehearing
of the Final Written Decision

37 C.F.R. § 42.71

Denying Petitioner's Request to Admit and Consider New Evidence
Denying Patent Owner's Request to Admit and Consider New Evidence

37 C.F.R. § 42.5

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I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition to institute *inter partes* review of claims 5 and 6 of U.S. Patent No. 10,015,408 B2 (Ex. 1001, “the ’408 patent”) on February 5, 2020. Paper 2 (“Petition” or “Pet.”). Corephotonics, Ltd. (“Patent Owner”) filed a Preliminary Response. Paper 7. We instituted an *inter partes* review of each of the challenged claims on the ground set forth in the Petition. Paper 8. Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 13, “PO Resp.”), Petitioner filed a Petitioner Reply (Paper 18), and Patent Owner thereafter filed a Sur-Reply (Paper 20).

An oral hearing was held on May 26, 2021 and a transcript of the hearing has been entered into the record. Paper 31. On July 26, 2021, we entered a Final Written Decision (Paper 32, “Decision” or “FWD”) determining that Petitioner did not demonstrate by a preponderance of the evidence that any of the challenged claims were unpatentable. Petitioner requests rehearing (Paper 33, “Req. Reh’g”) of our Decision.

In its Rehearing Request, Petitioner urges us to reconsider our Decision, and then also urges us to admit and consider new documents that became available after we entered our Decision. Specifically, Petitioner urges us to admit a brief (“Korean Brief”) prepared and submitted by Patent Owner in connection with a proceeding before the Patent Court of Korea (“Korean Court”).¹ Patent Owner filed a brief opposing the admission of the Korean Brief. Paper 34 (“PO Brief”). Patent Owner also urges us to admit and consider new documents. Specifically, Patent Owner filed a brief urging us to admit a certified translation of another brief,

¹ Petitioner attaches a certified translation of the Korean Brief to its Rehearing Request.

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filed by a third party, LG Innotek Co., Ltd. (“LG Brief”) in a proceeding before the 3rd Division of the Korean Court. Paper 35 (“PO LG Brief”). Petitioner opposed admission of the LG Brief. Paper 36 (“Opp. LG Brief”). For the reasons set forth below, Petitioner’s Rehearing Request is denied. We further do not admit either the Korean Brief or the LG Brief.

II. LEGAL STANDARDS

A party requesting rehearing bears the burden of showing that a decision should be modified. 37 C.F.R. § 42.71(d). The party must specifically identify all matters it believes the Board misapprehended or overlooked, and the place where each matter was addressed previously in a motion, an opposition, or a reply. *Id.* A request for rehearing, therefore, is not an opportunity merely to disagree with the Board’s assessment of the arguments or weighing of the evidence, or to present new arguments or evidence. *See, e.g., Presidio Components, Inc. v. AVX Corporation*, IPR2015-01332, Paper 21, 4 (PTAB Feb. 21, 2016) (“Patent Owner’s arguments in this regard amount to a mere disagreement with our analysis or conclusion. But mere disagreement with our analysis or conclusion is not a sufficient basis for rehearing. It is not an abuse of discretion to provide analysis or conclusion with which Patent Owner disagrees.”).

III. THE PARTIES’ ARGUMENTS

In the Final Written Decision, we determined that Petitioner had not met its burden of showing, by a preponderance of the evidence, that claims 5 and 6 of the ’408 patent are unpatentable over U.S. Patent Application Publication No. 2012/0026366 A1 (Ex. 1005, “Golan”) and Japanese Patent Application Publication No. S58-62609 (Ex. 1007, “Kawamura”). FWD 2; *see* Pet. 13–20.

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Petitioner now requests that we reconsider the conclusion rendered in our Decision and instead conclude that claims 5 and 6 are unpatentable over the combination of Golan and Kawamura. Req. Reh’g 3.

A. Arguments Regarding the Final Written Decision

In Section II.A of its Request for Rehearing, Petitioner argues that, in determining a person of ordinary skill in the art (“POSITA”) would not have been motivated to combine Golan and Kawamura, we relied on Patent Owner’s “unsupported representations that [a] ‘*rich literature*’ of miniature telephoto lens designs existed in 2013” and arguments that a POSITA would have looked to this “rich literature” instead of looking to Kawamura. Req. Reh’g 5 (quoting FWD 36 (“A POSITA would not have been motivated to go beyond [the] rich literature of miniature lens designs and try scaling old lenses.” (quoting Ex. 2003 ¶ 87))) (citing PO Resp. 39; Paper 31, 29:21–24; Sur-Reply 14). Petitioner contends that Patent Owner directly contradicted its representation about the “‘rich literature’ of miniature telephoto lens designs” in a proceeding before the Korean Court and that, accordingly, our determination that Petitioner’s challenge lacked a sufficient motivation to combine Golan and Kawamura is unsupported. *Id.* (emphasis omitted) (citing Ex. 1036, 2, 7).² *Infra* §§ IV.A–B.

In Section II.B of the Rehearing Request, Petitioner argues that neither Golan nor Kawamura are limited to their examples and that the Board misconstrued the scope of these references by limiting the disclosed devices to the specific dimensions set forth in the disclosed examples. *Id.* at 7–9 (“The Decision

² When referring to the Korean Brief, Petitioner cites to Exhibit 1036. A certified translation of the Korean Brief was filed as an attachment to Petitioner’s Request for Rehearing, not as an exhibit.

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effectively treated Golan’s teachings as excluding scope that does not require a miniature telephoto lens, based solely on an exemplary image sensor in Golan’s background. This is clear error.”). Petitioner contends that our Decision “explained that ‘disclosure of the 5 megapixel image sensor array in Golan supports the finding that Golan is at least applicable to miniature digital cameras and image sensors such as those used in mobile devices’, but provided no explanation of why and how such ‘at least applicable’ finding operated as a limitation on a POSITA’s understanding of Golan’s scope, by excluding scope beyond the ‘at least applicable’ finding.” Req. Reh’g 8 (citing FWD 34) (emphasis omitted). *Infra* §§ IV.C, IV.G.

Petitioner additionally argues that the Board improperly required that the supporting reference, U.S. Patent No. 8,896,697 B2 to Golan et al. (Ex. 1022, “Golan ’697”) “mention Golan or the invention described” to inform a POSITA’s understanding of Golan. *See id.* at 11. Petitioner further argues that the Board made unsupported factual findings by not finding there was sufficient support for image sensors of Golan ’697 to correspond to the device and method of Golan. *Id.* at 12 (“The Board’s statement that ‘[t]here is no ... evidence that Golan’s teachings are applicable to larger-scale imaging systems’ (FWD, at 34) is thus erroneous, because it ignores the disclosure in Golan ’697 (incorporating provisional application No. 61/167,226, ‘the ’226 Provisional’) of precisely such applications of the teachings of Golan to a larger-scale imaging system.”). Petitioner further argues that our Decision “overlooked that Golan (APPL-1005) and Golan 697 (APPL-1022) are related patents, both claiming priority to the same provisional . . . and incorporating that same provisional by reference” and “[a] POSITA would have understood—from the face, common priority and incorporated content—correspondence between a related patent and patent publication from the same

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provisional.” *Id.* at 12 (citing Ex. 1005, code (60), ¶ 1; Ex. 1022, code (60), 1:7–10); *infra* § IV.D.

In Section II.C, Petitioner argues that our reliance on Dr. Moore’s testimony was conclusory and ignored modifications well known to a POSITA. Req. Reh’g 16. Petitioner further contends that we erred in concluding that Petitioner’s contention of predictable results was generic without analyzing Petitioner’s arguments. *Id.* (“The Board ignored well-known modifications other than scaling, and ignored Dr. Sasián’s detailed testimony (including lens design software analysis) regarding how a POSITA would have modified Kawamura, *not simply/only scaled* it, to smaller sizes”) (citing Pet. Reply, 22–23; Ex. 1013 ¶¶ 28–33, Appendix B-ZEMAX analysis, ¶¶ 40–49); *infra* §§ IV.I–J.

Finally, Petitioner argues the Board erred by requiring bodily incorporation of Kawamura’s exemplary reference into Golan’s system and ignored modifications that were within a POSITA’s skill. Req. Reh’g 16. Petitioner also argues that “the Decision incorrectly required conclusory proof of ‘a finite number of identified, predictable solutions,’ which is not necessary to show obviousness.” *Id.* at 17 (citing FWD, 38 (“a POSITA would have understood that there were only a few options for telephoto lens design”)). *Infra* §§ IV.H–K.

B. Arguments Regarding the Korean Brief

Petitioner argues that “good cause exists because PO’s admission to the Korean tribunal directly contradicts the representations PO made to this one, and this tribunal was thereby misled into finding in PO’s favor based on those misrepresentations.” Req. Reh’g 1. According to Petitioner, “PO and its expert failed to identify any miniature telephoto lens design out of its alleged ‘rich literature,’ so the Board relied solely on PO’s misrepresentation” but that “days after the FWD, Corephotonics admitted to the Korean tribunal that ‘there were

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hardly any telephoto lens assemblies applied to portable terminals’ in 2013.” *Id.* at 1–2 (citing Ex. 1036, 2, 7); *see id.* at 2 (citing *Ultratec, Inc. v. CaptionCall, LLC*, 872 F.3d 1267, 1271–75 (Fed. Cir. 2017) (abuse of discretion where Board refused to admit and consider conflicting evidence); *Paice LLC v. Toyota Motor Corp.*, 504 F.3d 1293, 1312 (Fed. Cir. 2007) (counsel statements weighed as evidentiary admissions)).

Petitioner further argues that “good cause exists because this new evidence could not have been presented earlier, as PO waited until after the FWD before making its contrary admission in Korea” and that “[t]he Board has found ‘good cause’ in similar circumstances.” *Id.* at 2 (citing *Unified Patents v. MV3 Partners*, IPR2019-00474, Paper 16 at 1–4 (PTAB Aug. 5, 2019) (admitting transcript as new evidence on rehearing where hearing occurred after the Board’s decision); *Ultratec*, 872 F.3d at 1272 (“inconsistent testimony did not exist sooner”)).

Patent Owner responds that the statements in the Korean Brief cited by Petitioner do not show any contradiction on the part of Patent Owner. PO Brief 1 (explaining that the statements regarding lenses in before the Korean Tribunal dealt with lenses with a Total Track Length (TTL length of < 6.5 mm while scaling Kawamura to be compatible with Golan would lead to a lens with a TTL length of 13.49 mm). According to Patent Owner, “[e]ven assuming that *no* telephoto lenses for ‘portable terminals’ requiring TTL < 6.5 mm had existed in 2013, that would not contradict anything said by Corephotonics or relied on by the Board in the FWD concerning the availability of telephoto lens designs that could have been used instead of a scaled Kawamura lens.” *Id.*

Patent Owner further argues that the statements in the Korean Brief were made only as statements about the undeveloped record in the Korean case, and

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reflect the substantive difference between American and Korean patent law, namely, the requirement of an inventive step in Korean patent law. *Id.*

Patent Owner also argues that Petitioner’s factual position based on the Korean Brief is contrary to what Petitioner itself has previously represented to the Board in other IPR proceedings. *Id.* at 1–2. According to Patent Owner, it is too late after the issuance of the Final Written Decision for Petitioner to change to a long-held factual position. *Id.* at 2.

We discuss the parties’ arguments regarding the Korean Brief below in Section IV.A.

C. Arguments Regarding the LG Brief

Patent Owner argues that “[g]ood cause exists to admit the []certified translation of LG Innotek Co., Ltd.’s (LG) August 12 brief to the Patent Court of Korea” because “LG supplies a majority of the camera modules used by Apple, . . . account[ing] for a majority of LG Innotek’s revenue” and the LG Brief “clearly shows that Apple’s camera module supplier disagrees with the factual premise that Apple now asks the Board to accept: ‘that there were almost no telephoto lens assemblies for small form factors available in 2013.’” PO LG Brief 1.

Patent Owner further argues that “the brief shows that Corephotonics’ statement about ‘one precedent document’ in its brief was based on an incompletely developed factual record” and that LG “cites four new prior art references that purportedly show telephoto lens assemblies in a mobile phone.” *Id.*

Finally, Patent Owner argues that

the brief illustrates a difference in substantive law between Korea and the U.S. which underlies the Corephotonics statements Apple points to. Although LG’s counsel is aware of the U.S. IPR proceedings, e.g. Attachment at 17, neither they nor Corephotonics mentioned in the Korean case the other mobile phone telephoto lens

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art Apple has cited in its IPRs. *See* Ex. 2015 at 112:7–114:18. That is because those other references were unpublished patent applications as of Corephotonics’ priority date. While unpublished applications are considered to be known to the POSITA for purposes of obviousness in the United States, they are not considered within the prior art for the purposes of “inventive step” in Korea. KIPO Patent Examination Guidelines, January 2021 at 303–04, 341–43 (https://www.kipo.go.kr/upload/en/download/Patent_Examination_Guidelines_2021.pdf).

Id.

Petitioner responds that the LG Brief is a “*non-party* statement” that “is not relevant to the question presented by PO’s Korean Brief: namely, whether, in fairness and the interests-of-justice, *PO* should be allowed to take directly contrary positions before different judicial tribunals in order to secure patentability of patents from the same field and timeframe.” Opp. LG Brief 1.

We discuss the parties’ arguments regarding the LG Brief below in Section IV.L.

IV. ANALYSIS

Turning to Petitioner’s arguments, we begin by noting that Petitioner has not pointed us to precedent for admitting evidence after trial has concluded and after a Final Written Decision has issued. *See* Req. Reh’g 4–7. In *Huawei Device Co. v. Optis Cellular Tech.*, IPR2018-00816, Paper 19 at 4 (PTAB Jan. 8, 2019) (precedential), the Board determined that the standard for admitting new evidence with a rehearing request requires a showing of good cause. Separately, 37 C.F.R. § 42.123 requires that any supplemental evidence must be filed within *one month* of the date the trial is instituted and late submissions of evidence beyond this date must be in the interest of justice. *Id.* In the present proceeding, for the reasons discussed below, we did not solely rely on Dr. Moore’s testimony regarding the

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“rich literature of miniature telephoto lenses” and even if we disregard that testimony completely, the outcome of our Decision would not change as we explain in detail in Section IV.A below.

A. The Korean Brief Is Not Admitted

As to Petitioner’s first argument in Section II.A, Petitioner is correct in noting that we credited Dr. Moore’s testimony that “[a] POSITA would not have been motivated to go beyond [the] rich literature of miniature lens designs and try scaling old lenses, designed for different purposes, with little reason to expect the result would be manufacturable.” Req. Reh’g 5; FWD 36 (quoting Ex. 2003 ¶ 87). This portion of Dr. Moore’s testimony is not directly contradicted by the Korean Brief because, in the Korean Brief, Patent Owner states that “there were hardly any telephoto lens assemblies *applied to portable terminals* at the time the application of the invention of the subject patent was filed” noting that “only one . . . Reference 1 (Exhibit No. Eul-4) discloses the small telephoto lens assembly *for portable terminals* before the priority date of the invention of the subject patent.” *Id.* (Korean Brief Attachment 2) (emphasis added); *see also id.* at 7 (“Since the technical concept of the telephoto lens assembly for a portable terminal was different from the general telephoto camera in many ways, at the time of filing for the invention for the subject patent, a person of ordinary skill in the art did not think that the telephoto lens assembly could be installed in the portable terminal). That is, Dr. Moore refers to a breadth of miniature lens designs, whereas the Korean Brief more particularly refers to a dearth of telephoto lens assemblies *applied to portable terminals*—the record does not indicate that the portable terminals mentioned in the Korean Brief are necessarily miniature. Thus, the admission of the Korean Brief is moot because its admission would not affect our analysis. Therefore, good cause does not exist, nor would it be in the interest of

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justice, to admit the Korean Brief as it would expend judicial resources and expand the scope of a concluded trial without sufficient cause.

B. Petitioner's Challenge Was Deficient Even Absent Dr. Moore's Allegedly Contradictory Testimony

Even if we were to exclude this portion of testimony (i.e., had this portion of Dr. Moore's testimony been stricken from the record), our conclusion of obviousness would not change. Patent Owner's allegedly contradictory statements do not change the outcome in this case because Petitioner, not Patent Owner, bears the burden of showing that the claims were obvious under their proposed combination. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2019). For the reasons below in our discussion of Petitioner's arguments set forth in Sections II.B and II.C of its Rehearing Request, Petitioner did not meet this burden—Petitioner's challenge was deficient on its own, irrespective of whether we gave weight to this portion of Dr. Moore's testimony. Stated differently, even if we discredited Dr. Moore's testimony with regard to the "rich literature of miniature lens designs," for example, because of the statements in the Korean Brief, Petitioner failed to present sufficient evidence that supports a determination that a POSITA would have contemplated the proposed modifications, and ultimately, recognized the obviousness of the proposed combination of Golan and Kawamura.

C. Golan Is Not Limited to the Dimensions of Its Examples

Petitioner's arguments in Section II.B. of the Rehearing Request mischaracterize our Decision as limiting Golan and Kawamura to their examples. *See* Req. Reh'g 7–9. In our Decision, we noted that Golan expressly discloses a 5

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megapixel image sensor array, but that “there is insufficient evidence of record to support the proposition that Golan’s teachings are applicable to imaging systems that are of a scale larger than that of the miniature cameras and image sensors used in mobile devices.” FWD 26. We based this determination, in relevant part, on Dr. Sasián’s Reply Declaration (*see, e.g.*, Ex. 1013 ¶¶ 15–21, 28), in which he testified that Golan’s teachings are applicable to imaging systems that are of a scale larger than that of the miniature cameras and image sensors used in the systems of Exhibits 1022, 1024, 1026, 1029–1032, 1034, and 1035, which were cited to support this testimony. We found this testimony to be unpersuasive because Exhibits 1022, 1024, 1026, 1029–1032, 1034, and 1035 do not address devices like those taught by Golan. Exhibits 1022, 1024, 1026, 1029–1032, 1034, and 1035 exemplify different sizes of imaging systems, but do not indicate that an image sensor array and device *of the type disclosed in Golan* —a dual lens, fixed focal length digital imaging system with two different fields of view—would have been understood to have the different (larger) dimensions and pixel resolutions of the magnitude of Kawamura.³ *See* Ex. 1013 ¶ 18; PO Resp. 6–8 (citing-in-part Ex. 2015, 99:14–22); FWD 30 (citing Ex. 1013 ¶ 24 (citing Ex. 1005 ¶ 9)). The devices disclosed in Exhibits 1022, 1024, 1026, 1029–1032, 1034, and 1035 are smaller than that which is sufficient to accommodate a lens assembly of the size disclosed in Kawamura. And Dr. Sasián did not persuasively explain why the

³ Exhibit 1029 discloses Kodak’s EasyShare V610 dual-lens digital camera manual as having a 1/2.5” sensor and a 5.3-megapixel image. *Infra* § IV.E. Dr. Sasián does not indicate that the two lenses have a fixed focal length or different fields of view, nor does he persuasively explain why the teachings of Exhibit 1029 would be applicable to a system with two lenses having fixed focal lengths and/or different fields of view. Ex. 1013 ¶ 21.

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teachings of Exhibits 1022, 1024, 1026, 1029–1032, 1034, and 1035 would be applicable to Golan. Ex. 1013 ¶¶ 15–21, 28. We did not require, as claimed by Petitioner, that a supporting or background reference *must* mention Golan or its invention. *See* FWD 30–33; *see also* Req. Reh’g 11 (quoting FWD 30–33 (“[t]he Board then compounded its exclusion error, reasoning that a supporting reference must ‘mention Golan or the invention described therein,’ to inform a POSITA’s understanding”)). Instead, we determined that “Petitioner does not point to any portion of these exhibits that mentions Golan or the invention described therein,” “[n]or does Petitioner point to evidence that sufficiently addresses the applicability of Golan’s specific teachings to any particular product or imaging system described in the cited exhibits,” nor does Dr. Sasián’s Reply Declaration “offer perspective or sufficient explanation as to how a POSITA would have understood these exhibits to support his testimony and conclusions,” nor does Petitioner “show sufficiently that the imaging systems in *any* of these exhibits achieve ‘light weight electronic zoom’ using ‘two fixed focal length lenses and “two (or more) image sensors, having different fixed FOVs”’ ‘with a large lossless zooming range,’ as Dr. Sasián testifies that Golan teaches.” FWD 30 (citing Ex. 1013 ¶ 24 (citing Ex. 1005 ¶ 9)).

With regard to the cases we cited in our Decision as a “useful comparison” (i.e., using “*Cf.*”), *Abbott Labs. v. Dey, L.P.*, 287 F.3d 1097, 1104 (Fed. Cir. 2002) and *Astrazeneca AB v. Mut. Pharm. Co.*, 384 F.3d 1333, 1340 (Fed. Cir. 2004), Petitioner contends that neither case limits “the use of supplemental prior art references for showing a POSITA’s ‘background knowledge’ and understanding of *reference disclosure*” and that “[n]either case alters the rule that a *prior art reference* must be evaluated ‘not only for what it expressly teaches, but also for what it fairly suggests.’” Req. Reh’g 11 (citing *Bradium Technologies LLC v.*

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Iancu, 923 F. 3d 1032, 1049 (Fed. Cir. 2019)). We agree with Petitioner that a prior art reference must be evaluated in context and for what it fairly suggests. Petitioner, however, has not shown that the prior art it cites suggest the claimed invention.

D. Golan '697 Is Not Dispositive as to how To Interpret Golan

As set forth above, it is Petitioner's burden in an IPR proceeding to show that the contested claims are unpatentable. Here, Petitioner did not provide sufficient explanation, nor point to relevant case law, to explain why would should consider the disclosure of Golan '697 to be part of Golan's disclosure. Golan does not incorporate Golan '697 by reference, and Petitioner did not point to any case law supporting a presumption that Golan and Golan '697 refer to the same invention because both claim priority to and incorporate by reference the '226 Provisional. *See* Req. Reh'g 12–15. We further note that Golan and Golan '697 have different titles, abstracts, and specifications. *Compare* Ex. 1001 *with*, Ex. 1022. Petitioner also does not persuasively explain why Golan '697 provides relevant background information for Golan.

Petitioner's citations to *Unwired Planet, LLC v. Apple Inc.*, 829 F.3d 1353, 1359 (Fed. Cir. 2016) and *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1357 (Fed. Cir. 2004) are inapposite. *Unwired Planet* concerns how we interpret patent claims in light of the specification, and warns against limiting claims beyond their plain meaning to include a limitation disclosed in all of the embodiments or the only embodiment. *Unwired Planet*, 829 F.3d at 1359. Similarly, in *Home Diagnostics*, the Federal Circuit held that “the patent's preferred embodiment is just that—one way of using the invention” and “[t]hat disclosure alone does not clearly and unambiguously disavow other ways of computing the endpoint *within the scope of the claim language*.” *Home*

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Diagnostics, 381 F.3d at 1357 (emphasis added). As we have repeatedly stated, we are not limiting Golan to a device having the expressly-disclosed resolution (i.e., 5 megapixels) and correspondingly-dimensioned image sensor array and imaging device. We clarify that we determine, instead, that a POSITA would not have understood Golan to teach or suggest image sensor arrays or imaging devices of a size compatible with that of the telephoto lens assemblies taught or suggested by Kawamura.

In any event, Golan '697 conveys little, if anything, about size and instead, was cited in Dr. Sasián's testimony as disclosing "an imaging system, operatively mounted on an air-born vehicle." Ex. 1013 ¶ 17. It does not even discuss scaling an image sensor array, imaging device, or lens assembly—at best, it discloses that "[a]n image sensor is generally subject to motion and vibrations which might distort a detected image of a scene" in which "[t]he motion can be linear, where the image sensor undergoes a linear displacement or scaling, and the motion can be angular, where the image sensor rotates about one or more axes." Ex. 1022, 1:23–27.

E. Golan's Disclosure of a 155-megapixel Resolution Relates to a Prior Art Single Optical Zoom Lens, not Its Dual-Lens Electronic Zoom Device

Petitioner notes that our finding that Golan only discloses a size of 5 megapixels "is, in fact, contrary to Golan's disclosure" because Golan describes an example of a 155-megapixel image sensor array that can obtain an optical zoom of x36. Req. Reh'g 13 (citing Pet. Reply 7–11; Ex. 1005, Fig. 1, ¶ 13; Ex. 1022, 1:14–18, 1:67–2:1, 5:55–57; '226 Provisional (expressly incorporated in Ex. 1005 and 1022), 3:12–13, Fig. 5 (describing Fig. 5 as a "zoom control sub-system for an air-born camera system")). Petitioner's argument does not provide the necessary context of this disclosure in Golan.

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Golan discloses that

*the present invention describes a continuous electronic zoom for an image acquisition system, having multiple imaging devices each with a different fixed field of view (FOV). Using two (or more) image sensors, having different fixed FOV, facilitates a light weight electronic zoom with a large lossless zooming range. For example, a first image sensor has a 60° angle of view and a second image sensor has a 60° angle of view. Therefore, Wide_FOV=Narrow_FOV*6. Hence, switching between the image sensors provide a lossless electronic zoom of $6^2=36$.*

Ex. 1005 ¶ 9 (emphasis added). Golan contrasts this example of its invention having lossless *electronic* zoom of x36, which is achieved two image sensors each having *fixed* fields of view, with “obtain[ing] similar zoom (x36) by *optical means*,” noting that, “for an output resolution frame of 400x300, the needed sensor array is” a 155-megapixel image sensor array. *Id.* ¶¶ 10, 13 (emphasis added). Golan explains that “[e]lectronic zoom is accomplished by cropping an image down to a centered area of the image with the same aspect ratio as the original . . . without any adjustment of the camera's optics, and no optical resolution is gained in the process.” *Id.* ¶ 3. Golan explains that “[e]lectronic zoom *does not need moving mechanical elements, as does optical zoom.*” *Id.* ¶ 7 (emphasis added). As part of its background, Golan recognizes that “[t]ypically, a camera with a large dynamic zoom range requires heavy and expensive lenses, as well as complex design” and as such, “[t]here is a need for and it would be advantageous to have image sensors, having static, light weight electronic zoom and a large lossless zooming range.” *Id.* ¶¶ 7, 8. Thus, Golan *contrasts* the size of image sensor array (i.e., 155 megapixels) and lenses needed to achieve an optical zoom that is on the same order of electronic zoom achievable by Golan’s invention.

Accordingly, we are not persuaded to alter our Decision based on this argument and the cited portions of Golan. More particularly, we are not persuaded

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that Golan teaches or suggests using its invention—an imaging device with image sensors with fixed fields of view “having static, light weight electronic zoom and a large lossless zooming range”—with the contrasted “heavy and expensive lenses” image sensor arrays providing resolutions on the order of 155 megapixels and other correspondingly-sized components. *Accord* PO Resp. 20 (citing Ex. 2007 (Galstain), 4; Ex. 2003 ¶ 53) (“It is only in the largest, most expensive sensors, having pixel counts in excess of 10 megapixels, that pixels are larger.”).

Petitioner contends that “[t]he Board’s finding that Golan is limited to ‘a miniature digital camera’ with ‘correspondingly-sized image sensors (*e.g.*, 1/4-inch or 1/3-inch miniature digital sensors)’ also overlooked undisputed evidence that the exemplary 5MP (**resolution**) sensor may be implemented as a sensor of different **dimension**, such as a nonminiature 1/2.5-inch sensor” and that “PO never addressed this evidence.” Req. Reh’g 14 (citing Pet. Reply 11; Ex. 1029, 62; Ex. 1013 ¶ 21; FWD, 26, 28).

Our Decision states that “there is insufficient evidence of record to support the proposition that Golan’s teachings are applicable to imaging systems that are of a scale larger than that of the miniature cameras and image sensors used in mobile devices” and describes “correspondingly-sized image sensors (*e.g.*, 1/4” or 1/3” miniature digital sensors)” as exemplary, *not* limiting as Petitioner contends. FWD 26, 34. We note that Patent Owner’s evidence, Table 1.1 comparing camera formats in Galstain, does not depict whether a 1/2.5” sensor would fall under the “miniature camera modules” heading or the “digital still cameras” heading. Ex. 2007, 62. The largest sensor under the “miniature camera modules” heading is 1/3” and the smallest sensor under the “digital still cameras” heading is 1/2.3”—if anything, a 1/2.5” sensor is closer to the size of sensor consistent with a digital still camera instead of the size of sensor consistent with a miniature camera module.

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Accord Ex. 1029, 62 (Kodak’s EasyShare V610 dual-lens digital camera manual disclosing a 1/2.5” sensor and a 5.3-megapixel image).

F. Petitioner’s Challenge Does Not Explain “Relative to”

Irrespective of whether a 5-megapixel resolution as disclosed in Golan can be achieved using a 1/2.5” sensor, the only reason Petitioner provides for looking to Kawamura is that Golan does not disclose a specific lens prescription for its telephoto lens and as such, “a POSITA would have been motivated to apply Kawamura’s teachings of tele lens because of the imaging benefits *and compactness of an overall length* with excellent image-formation performance as taught by Kawamura.” Pet. 20 (citing Ex. 1003 ¶ 60) (emphasis added). But the Petition does not explain what the “compactness of an overall length” of Kawamura’s telephoto lens assembly *is relative to*. The record does not sufficiently show how Kawamura’s telephoto lens assembly would be considered compact enough in overall length to be used with, for example, a 1/2.5” sensor, nor does it explain how an approximately 7.9-inch telephoto lens assembly (i.e., with an approximately 200 mm focal length) would have been considered “lightweight” relative to Golan’s invention, nor does it explain how the 7.9-inch lens assembly in 1983 would have been considered “lightweight” by a POSITA at the time of the invention of the ’408 patent at least thirty years later.

To the extent that “Petitioner . . . take[s] the position that Kawamura’s lens assembly is lightweight compared to some other lens assemblies—like the nearly ten pound Fujinon A36X14.5 lens,” (*see* FWD 35), this position was not presented with sufficient particularity in the *Petition* at least because the Petition does not cite any teaching or suggestion of the weight or size of the single optically-variable zoom lens set forth in Golan’s background. Although Dr. Sasián testifies that what constitutes “heavy” or “lightweight” is relative (Ex. 1013 ¶ 25), the Petition never

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addresses what these terms are relative to. As such, we are not persuaded that we “misapprehended ‘lightweight,’ divorced from Golan’s context of achieving ‘lightweight’ by using fixed focal length lenses in digital zoom rather than a single optically-variable zoom lens, and errantly required ‘lightweight’ to be lighter than some unspecified value presumptively associated with Golan’s exemplary 5MP sensor.” Req. Reh’g 14 (citing FWD 35).

G. Kawamura Is Not Limited to Its Examples

Petitioner contends that “Kawamura’s ‘Scope of Patent Claim’ is not limited by focal length/dimension/weight, so the scope of Kawamura disclosure, including at least its scope of patent claim, also would not have been understood to be so limited.” Req. Reh’g 10 (citing Pet. 15–17, 22–23; Ex. 1007, 1, Fig. 1; Ex. 1013 ¶¶ 29–33, Table 1). Petitioner contends that, instead, “Kawamura both teaches and fairly suggests a continuum of telephoto lens designs as a function of a desired focal length (F) using conditions (1) to (8) (FIG. 2A), which are *not* limited to any particular focal length or size/weight inferred therefrom (*see* FIGS. 2B–2C).” *Id.* This argument does not appear in the cited portions of the record (Pet. 15–17, 22–23 (citing Ex. 1007, 1 (Title, Scope of Patent Claim), Fig. 1; Ex. 1003 ¶¶ 53–59; Ex. 1013 ¶¶ 29–33, Table 1) and Petitioner’s Figures 2A–2C do not appear to be have been presented before the Rehearing Request. *See* 37 C.F.R. § 42.71(d) (“The party must specifically identify all matters it believes the Board misapprehended or overlooked, *and the place where each matter was addressed previously in a motion, an opposition, or a reply.*” (emphasis added)). While we do *not* limit Kawamura to only the ~200mm focal length of its examples, the record does not support a finding that a POSITA would have understood Kawamura to teach or suggest a telephoto lens assembly with a lens prescription

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that has any focal length, size, and weight, such that it would have been considered “lightweight” or compact in overall length relative to Golan’s invention or other, background disclosures, or relative a POSITA’s understanding of those terms at the time of the invention of the ’408 patent.

H. The Decision Did Not Require Petitioner To Show a Finite Number of Options

Aside from asserting that Kawamura’s telephoto lens assembly had a “compactness of overall length,” Petitioner does not provide any standalone, non-generic reason for looking to Kawamura, i.e., other than the fact that Golan does not disclose a specific lens prescription for its telephoto lens. In our Decision, we noted that “there is insufficient evidence of record to support a finding that a POSITA would have understood that there were only a few options for telephoto lens designs from which to choose such that Kawamura’s lens assembly would have been the “obvious” choice.” FWD 38 (citing *Procter & Gamble Co. v. Teva Pharm. USA, Inc.*, 566 F.3d 989, 996 (Fed. Cir. 2009)). We did *not* make it a requirement for Petitioner to show a finite number of options for telephoto lenses or miniature telephoto lenses. In the absence of any persuasive reason to look to Kawamura in particular (we explained above why the reason about Kawamura’s disclosure of “compactness of overall length” was not persuasive), we *further* noted that did not Petitioner remedy the deficiency by persuasively explaining that there were few or no miniature telephoto lens designs to look to (Petitioner did not make this argument until its Reply) such that combining Kawamura with Golan would have been obvious to POSITA—we did not *require* Petitioner to show this. FWD 38 (citing *Procter & Gamble Co. v. Teva Pharm. USA, Inc.*, 566 F.3d 989, 996 (Fed. Cir. 2009) (“We *further* note that there is insufficient evidence of record to support a finding that a POSITA would have understood that there were only a few options for telephoto lens designs from which to choose such that Kawamura’s

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lens assembly would have been the ‘obvious’ choice.” (emphasis added)); *see also* Ex. 2015, 114:14–18 (Dr. Sasián’s testimony acknowledging there were several, well-known “lens designs that were publicly known for telephoto and miniature cameras” during the relevant timeframe).

Supporting Petitioner’s rationale for combining Golan and Kawamura, Dr. Sasián testified that any needed modification would have been within the level of ordinary skill in the art and specifically, that lens scaling was a well-known practice in lens design. Ex. 1003 ¶¶ 63, 64 (quoting Ex. 1006 (“A lens prescription can be scaled to any desired focal length simply by multiplying all of its dimensions by the same constants. All of the linear aberration measures will then be scaled by the same factor.”)). Dr. Sasián’s testimony is that Kawamura *could* be scaled, but doesn’t explain why a POSITA would think Kawamura was small enough or should be scaled to be small enough to be compatible with Golan’s invention. *See id.* ¶ 64. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only could have made but would have been motivated to make the combinations or modifications[.]”).

I. The Decision Did Not Ignore or Misunderstand Dr. Sasián’s Testimony

Petitioner’s arguments in Section II.C of the Rehearing Request rehash arguments considered fully and rejected in our Final Written Decision, and fail to show that we misapprehended or misconstrued those arguments in reaching that conclusion. *See* Req. Reh’g 16 (citing Pet. Reply 22–23; Ex. 1013 ¶¶ 28–33, Appendix B-ZEMAX analysis, ¶¶ 40–49) (“The Board ignored well-known modifications other than scaling, and ignored Dr. Sasián’s detailed testimony (including lens design software analysis) regarding how a POSITA would have modified Kawamura, *not simply/only scaled* it, to smaller sizes.”). In using the

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term “scaling” in the Final Written Decision and in this Decision, we use it in the same manner as Petitioner and Dr. Sasián, that is, to encompass scaling and additional, attendant modifications:

A POSITA would have *scaled* the Kawamura lens prescriptions to fit into a digital camera of Golan while maintaining the compactness and an excellent image-formation performance. As shown with examples in Table 1 below, a POSITA would have understood that *sensors of various formats may be used in the combination of Golan and Kawamura based on the application, would have applied the appropriate scaling factor based on the image sensor format (e.g., scaling factors less than 10 for image sensors of 1/3” or greater), and would have found that modifications of Kawamura’s lens for the combination is practical*. Further, a POSTA would have found it practical, and indeed, would have *modified the field of view of Kawamura’s lens for a tele field of view that’s appropriate for a particular application (e.g., conventional digital still cameras, air-born vehicles/drones applications, etc.)*, including the example Narrow_FOV described in Golan.

Ex. 1013 ¶ 30 (emphasis added). If it was not persuasive to us that a POSITA would scale Kawamura, it is not clear why we would have considered and found Dr. Sasián’s testimony that a POSITA “would have found it practical, and indeed, would have modified the field of view of Kawamura’s lens for a tele field of view that’s appropriate for a particular application (e.g., conventional digital still cameras, air-born vehicles/drones applications, etc.)”, including the example Narrow_FOV described in Golan” sufficiently persuasive on its own. *Id.*

In the Rehearing Request, Petitioner argues that the Board misunderstood Dr. Sasián’s past statements. Petitioner argues that Dr. Sasián claimed lenses cannot be *simply* be scaled, which Petitioner alleges the Board construed as meaning lenses are *unable* to be scaled down. *See* Req. Reh’g 15–16. Petitioner misconstrues our Decision—we were not persuaded that Kawamura’s lens

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assembly would meet the needs identified in Golan, such as being lightweight. *See* FWD 35–36. Additionally, we noted that Dr. Sasián’s testimony is contradicted by his position taken in a published article that a POSITA may be dissuaded from such scaling due to an increase in fabrication and cost of materials, which are relevant considerations for determining if there is sufficient motivation to combine. FWD 36–37 (citing Ex. 2008, 1). Therefore, it is relevant whether Petitioner’s expert takes the position that Kawamura’s lens *assembly* cannot *simply* be scaled and cheaply—the above considerations and the difficulty of scaling weigh against motivation to combine. *See id.* As discussed in the next section, we also considered Patent Owner’s arguments and the portions of Dr. Moore’s testimony that are supported by sufficient underlying evidence.

J. Patent Owner’s Arguments and Dr. Moore’s Testimony Are Not Conclusory and Are Supported by Evidence of Record

Contrary to Petitioner’s assertion, the Board’s analysis did not adopt the conclusory opinion of Dr. Moore without evidence. We looked to considerations such as: manufacturing and fabrication constraints, material properties, diffraction and geometrical aberrations, which we were persuaded would have dissuaded a POSITA from scaling Kawamura in one of Petitioner’s alternative theories. *See* FWD 22, 23, 36–37 (citing-in-part Ex. 2008 (Reshidko), 1; Ex. 2012 (Bareau), 1). We clarify for the record we did not solely consider Reshidko and Bareau for the purposes of impeaching Dr. Sasián’s testimony—we found Patent Owner’s argument supported by the cited portions of these pieces of underlying evidence. Ex. 2008, 1; Ex. 2012, 1, 3; PO Resp. 35–37.

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K. The Decision Did Not Misapply KSR nor Did the Decision Require Bodily Incorporation of Kawamura into Golan

For similar reasons, we likewise disagree with Petitioner’s argument that we misapplied the law under *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007), and required bodily incorporation of Kawamura’s telephoto lens assembly. *See* Req. Reh’g 17. We did not do so. Instead, we determined that Petitioner did not present sufficient evidence that a POSITA would have been motivated to combine Kawamura’s lens assembly with Golan, particularly in light of the above considerations relating to scaling, as set forth above. FWD 35 (“Petitioner does not present sufficient evidence that a POSITA . . . would have thought of Kawamura’s 7-inch lens assembly as “lightweight” or “compact[.]”). Because Petitioner did not provide sufficient underlying evidence to support their reason, and because there are significant countervailing considerations a POSITA would have balanced, Petitioner did not meet this burden, and was not able to sufficiently show a motivation to combine that is supported by sufficient rational underpinning.

L. The LG Brief Is Not Admissible

Good cause does not exist, nor is it in the interests of justice, to admit the LG brief because even if it were admitted, it would not alter the outcome of our Decision. That is, it would not make any fact relied upon in our Decision more or less likely. This is due to the fact that LG brief includes only statements by a non-party to the present proceeding to a tribunal different from the one that adjudicates this IPR proceeding.

V. CONCLUSION

For the foregoing reasons, we are not persuaded that we misapprehended or overlooked any matter.

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VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner's Request for Rehearing is *denied*;

FURTHER ORDERED that Petitioner's request to admit and consider the Korean Brief is denied; and

FURTHER ORDERED that Patent Owner's request to admit and consider the LG brief is denied.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.
Petitioner,

v.

COREPHOTONICS, LTD.,
Patent Owner.

IPR2020-00489
U.S. Patent No. 10,015,408 B2

PETITIONER APPLE INC.'S NOTICE OF APPEAL

via E2E
Patent Trial and Appeal Board

via Hand Delivery
Director of the United States Patent and Trademark Office
c/o Office of the General Counsel, 10B20
Madison Building East
600 Dulany Street
Alexandria, VA 22314

via CM/ECF
United States Court of Appeals for the Federal Circuit

Petitioner Apple Inc.'s Notice of Appeal
Attorney Docket No. 52959.54R408

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Pursuant to 28 U.S.C. § 1295(a)(4)(A), 35 U.S.C. §§ 141(c), 142, and 319, and 37 C.F.R. §§ 90.2(a), 90.3, 28 U.S.C. § 1651, 5 U.S.C. §§ 701-706, and Federal Circuit Rule 15(a)(1), Petitioner Apple Inc. ("Petitioner") provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board ("Board") entered July 26, 2021 (Paper 32), from the Decision Denying Petitioner's Request on Rehearing entered July 27, 2022 (Paper 41), and from all underlying and related orders, decisions, rulings, and opinions regarding U.S. Patent No. 10,015,408 B2 ("the '408 patent") in *Inter Partes* Review IPR2020-00489.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), the expected issues on appeal include, but are not limited to: the Board's error(s) in determining that challenged claims 5 and 6 of the '408 patent are not unpatentable, the Board's denial of Petitioner's request to admit and consider a pertinent U.S. provisional patent application as well as a brief prepared and submitted by the patent owner in connection with a proceeding before the Patent Court of Korea, the Board's failure to provide a ruling (at the time this Notice is being filed) regarding Petitioner's unopposed request to include as exhibits in the agency record the parties' requests regarding additional evidence (conducted via e-mail pursuant to Board procedures), and all other issues decided adversely to Petitioner in any orders, decisions, rulings, or opinions.

Petitioner Apple Inc.'s Notice of Appeal
Attorney Docket No. 52959.54R408

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Pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a), a copy of this Notice is being filed with the Director of the United States Patent and Trademark Office and with the Patent Trial and Appeal Board. In addition, a copy of this Notice and the required docketing fees are being filed with the Clerk's Office for the United States Court of Appeals for the Federal Circuit via CM/ECF.

Respectfully submitted,

Dated: September 26, 2022

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Petitioner Apple Inc.'s Notice of Appeal

IPR2020-00489

Attorney Docket No. 52959.54R408

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CERTIFICATE OF FILING

The undersigned hereby certifies that, in addition to being electronically filed through PTAB E2E, a true and correct copy of the above-captioned PETITIONER APPLE INC.'S NOTICE OF APPEAL is being filed by hand with the Director on September 26, 2022, at the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel, 10B20
Madison Building East
600 Dulany Street
Alexandria, VA 22314

The undersigned also hereby certifies that a true and correct copy of the above-captioned PETITIONER APPLE INC.'S NOTICE OF APPEAL and the filing fee is being filed via CM/ECF with the Clerk's Office of the United States Court of Appeals for the Federal Circuit on September 26, 2022.

Respectfully submitted,

Dated: September 26, 2022

/David W. O'Brien/

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Attorney for Petitioner Apple Inc.

Petitioner Apple Inc.'s Notice of Appeal
 Attorney Docket No. 52959.54R408

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6, this is to certify that a true and correct copy of the foregoing "Petitioner Apple Inc.'s Notice of Appeal" was served on the Patent Owner Corephotonics, Ltd. as detailed below:

<i>Date of service</i>	September 26, 2022
<i>Manner of service</i>	Electronic Service by E-mail: – nrubin@raklaw.com – jchung@raklaw.com – mfenster@raklaw.com – jtsuei@raklaw.com
<i>Documents served</i>	Petitioner Apple Inc.'s Notice of Appeal
<i>Persons served</i>	Neil A. Rubin (nrubin@raklaw.com) C. Jay Chung (jchung@raklaw.com) Marc A. Fenster (mfenster@raklaw.com) James S. Tsuei (jtsuei@raklaw.com) Russ August & Kabat 12424 Wilshire Blvd., 12th Floor Los Angeles, CA 90025

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